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THE OIL WEEKLY

WORLD OIL

Forecast-Review Issue

1954 Previewed
1953 Reviewed

SPECIALIZED FOR EXPLORATION, DRILLING, PRODUCING, PIPE LINE OPERATIONS AND MANAGEMENT

FEBRUARY 15, 1954

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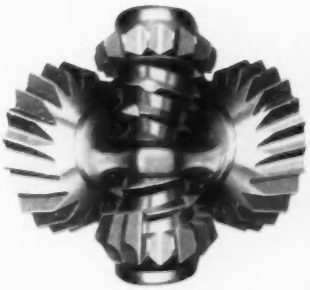

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WORLD OIL

Established 1916 as The OIL WEEKLY

Vol. 138, No. 3

February 15, 1954

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a quick look at WORLD OIL THIS MONTH

BUSY OIL MEN: To help you put first things first, scan these time-saving digests on this and the following pages, checking ☑ those you want to read first.

CURRENT OUTLOOK

☐ **The Changing Panorama.** Although there are some misgivings about the economic outlook in general, they do not appear too well founded insofar as the petroleum industry's prospects for 1954 are concerned. Based on present indications, the industry will have a business year as good as 1953, or better. Operations should show increases over 1953, as the demand for petroleum products is expected to expand further in 1954 by about 4 percent after increasing by that same amount in 1953. To meet the prospective market demand for oils, the industry will have to maintain operations at former levels or increase them. Accordingly, there are in prospect continued high levels of explora-

Turn the Page

tion activity, drilling, pipe line work, refinery runs of crude, and other operations. Page 55.

☐ **Petroleum Demand.** Domestic producers of crude oil and natural gasoline have a favorable outlook for 1954, and face a somewhat larger market for their production than in 1953. This prospect is indicated, as further increases in demand for petroleum products are forecast. The demand for all oils will average 8,340,000 barrels daily, an increase of 317,000 barrels or 3.9 percent over 1953, it is predicted. This would be about the same increase as in 1953, when the total demand averaged 8,023,000 barrels per day, an increase of 311,000 daily or 4.0 percent over 1952. More details on current and prospective demand for petroleum, including export and domestic demand, by products, appear on Page 58.

☐ **Exports and Imports.** Each year since 1947 the margin of U. S. imports over exports has widened. The pattern will hold this year. The market for U. S. crude exports is rapidly drying up. World need for U. S. refined products has declined steadily with the expansion of refinery capacity abroad. Crude imports in 1954 are expected to increase by 5.6 percent, while exports are expected to drop 22.3 percent. Page 64.

☐ **Petroleum Prices.** Some unsteadiness prevails in early '54. Future trends are uncertain. Crude prices do not appear to be in serious jeopardy so far, but they could be later in the year unless supplies of crude and products are held in line with market requirements. For a look at the price picture, see Page 71.

☐ **Stocks of Oils.** Excessive stocks of crude oil and refined products pose a threat in 1954. The U. S. oil industry must be alert to the situation. Heavy stockpiling of gasoline and distillate fuel oil marked 1953 activities. The demand and supply outlook for this year calls for no net increase in stocks of crude oil and relatively small net increase in refined products stocks. See Page 74.

☐ **Tax Changes.** New and proposed federal tax changes will have far-reaching effects on the oil industry in 1954. The excess profits tax has expired. A lower maximum capital gains tax is scheduled. A program has been offered for a more liberalized depreciation tax. Relief may be coming for investments outside of the U. S. Page 78.

☐ **Oil-Using Units.** Further increases are expected in the number of motor vehicles and other equipment requiring petroleum products for fuel and/or lubricants. The trend has been upward since the end of World War II. See Page 76.

☐ **Legislative Outlook.** The relative calm on the international scene has brought about a shift of emphasis to domestic issues. For the outlook on foreign trade policy, natural gas, public lands, and other issues important to the oil industry, see Page 82.

EXPLORATION ARTICLES

☐ **Exploration Record.** The industry's greatest exploratory effort of all time was turned in during 1953 when 11,708 tests were completed. This was an increase of 2.8 percent or 319 wells over the previous peak of 11,389 in 1952. The year's record-breaking operations also marked the twelfth straight year in which exploratory drilling has overshadowed the previous year. The upward trend has been in effect since the end of World War II. And the outlook for the coming year is for an even more active wildcatting program. Page 89.

☐ **Geophysical Crews.** The 751 geophysical and core drilling crews busy in December, 1953, marked a slight increase over December of the previous year. Activity again was at record high. Greatest percentage gain was registered by core drilling, which had 35 crews afield at year's end. Geophysical activity dropped slightly in the same period from 722 at end of 1952 to 716 last year. See Page 93.

☐ **Prospecting Outlook.** What is the outlook in the Rocky Mountain area? Will advanced recovery methods have any effect on the Spraberry Trend, a previous disappointment? What are the plans in the East Texas field . . . on the Gulf Coast . . . in Arkansas? How has water-flooding affected the Tri-State Basin area of Illinois, Indiana and Kentucky? These and other questions on the prospecting outlook for 1954 are answered beginning on Page 94.

DRILLING ARTICLES

☐ **Drilling Forecast.** Drilling activity in the U. S. is expected to rise to another all-time peak during 1954. WORLD OIL's annual forecast is for the completion of 49,564 wells this year and the drilling of 206,538,650 feet of hole in completing these wells. This prediction calls for 525 more wells and 10 million more feet of hole than drilled during 1953. For more details on the annual industry forecast, see Page 117.

☐ **Completions and Footage.** Surge at year's end produces greatest number of new wells and footage drilled in U. S. New wells completed total 49,039—2530 wells above 1952's record mark. Footage drilled amounts to 196,466,188, a gain of 8,073,493 feet over

THIS MONTH . . .

☐ **The ten best hints of 1953** in the fields of drilling, production and pipelining have been selected by a panel of experts representing the industry from coast-to-coast and are presented in this issue. In response to many requests, the favorite time and money-saving ideas submitted to WORLD OIL by its readers last year, were chosen from the more than 300 items published in the three hints sections during 1953. See the ten best drilling hints on **Page 134,** production hints, **Page 190,** pipe line hints on **Page 206.**

1952. Only in average depth per well did the industry miss a new performance peak. This figure was off slightly. For an area breakdown, turn to **Page 119.**

☐ **Wells Completed.** Larger U. S. producing companies continue to drill less than one-fourth of the wells completed in the U. S. Figures for 1953 show that smaller companies owned 37,689 or 76.9 percent of the 49,039 wells drilled. For other statistics, turn to **Page 122.**

☐ **Wells Drilled.** The number of U. S. wells drilled by rotary method continues to increase. In 1951 the number was 37,717; in 1952, 38,368, and this past years, 40,948. The percentage increase for the past three years was from 82 percent to 82.5 percent to 83.5 percent. Cable tools did a smaller part of the drilling due to a 1953 slump in activity in eastern states. See **Page 122.**

☐ **Rigs in Operation.** The average number of rigs in operation at the end of each month last year was 4784, 1.5 percent fewer than in 1952 and also less than in 1950. These figures reveal the efficiency with which the oil quest is being continued . . . fewer rigs drilled more holes and more footage in the U. S. during 1953. West Texas again was most active. Notable declines were recorded in Kansas and New Mexico. See **Page 124.**

☐ **Contract Drilling.** The number of U. S. wells drilled on a contract basis increased for the eleventh consecutive year during 1953. It is estimated that drilling contractors accounted for 92 percent of the wells drilled last year. Ten years ago they were doing only 70 percent of the drilling. For other details, turn to **Page 127.**

☐ **Rig Ownership.** Contractors own approximately 4400 or 85 percent of the drilling rigs in the U. S. For some figures based on an industry-wide survey which determined the ownership of 4767 rigs, see **Page 127.**

☐ **Drilling Depth Records.** Industry goes into new year with a new drilling depth record. The Ohio Oil Company's KCL A 72-4, Paloma Field, Kern County, California, was drilling at 21,482 feet as the year began. This broke by 961 feet the record set in 1949 by The Superior Oil Company of California's Unit 1, which went to 20,521 feet in Sublette County, Wyoming. For more about depth records, see **Page 128.**

PRODUCTION ARTICLES

☐ **Artificial Lift.** A total of 23,181 oil producing wells in the U. S. will be put on artificial lift for the first time in 1954. This is just 124 wells less than the 23,305 wells placed in this category during 1953, which was an all-time record for the industry. **Page 145.**

☐ **U. S. Crude Production.** Outlook is fairly encouraging for coming year. U. S. producers can expect to be called on to produce slightly more oil than in 1953 if the expected higher demand for petroleum products materializes. The predicted production of 6,556,000 barrels daily in 1954 is 97,000 barrels or 1.5 percent more than the output of 6,459,000 barrels daily in 1953. Prospect is for a continued rising trend. See **Page 146.**

☐ **Natural Gasoline.** A continued upward trend is forecast here, too. But at a rate less pronounced than in recent years. Markets turned unfavorable at close of year for liquid petroleum products extracted from natural gas. They remained that way early this year. Production exceeded market demand in 1953. Stocks of natural gasoline became burdensome. Inventories at the end of 1953 exceeded 12 million barrels. Prices of natural gasoline have reacted accordingly and cast a cloud over the industry as 1954 begins. See **Page 152.**

☐ **Natural Gas Production and Use.** Growth continues during 1953 and more of same is expected in 1954. Rate of increase in gas consuming customers shows no sign of slowing down. Annual marked production in 1953 reached 8.7 trillion cubic feet, double the 1946 volume and three times greater than in 1941. Biggest increase came from Texas, which produces half the gas in U. S. See **Page 154.**

☐ **Natural Gas Reserves.** Despite an amazing growth in production in recent years, the U. S. still is finding more natural gas and natural gas liquids

THIS MONTH . . .

than it is producing. Consequently the nation's proved producible reserves of both natural gas and natural gas liquids continue to rise to all-time peaks. **Page 163.**

☐ **Petroleum Reserves.** A record volume of development wells and wildcats and great technical advances in secondary recovery techniques enabled the industry to more than break even in maintaining adequate reserves in 1953. An even greater task lies ahead. See **Page 166.**

☐ **Producing Oil Wells.** Increase in 1953 sent U. S. total over a half million for the first time. Producing wells at year's end total 501,859, a 2.5 percent increase over the comparable 1952 figure. See **Page 172.**

☐ **Refinery Operations.** A rising concern over surplus product stocks and an alertness to the problem of products quality stand out at start of 1954. Past year produced a trend of booming capacity and hastening runs to stills. At year's end, daily capacity had leaped ahead to 8,078,000 barrels compared with 7,585,000 barrels for the same period a year earlier. See **Page 177.**

☐ **Producing Depth Records.** Record broken three times during year, but at start of 1954 the deepest productive well remained in Kern County, California, for fifth consecutive year. New mark is 17,892 feet. See **Page 178.**

☐ **LPG Sales.** Upswing continues. Total sales show healthy gain over 1952. The outlook is for greater emphasis on sales backed up by increased LPG production and increased transportation facilities. See **Page 184.**

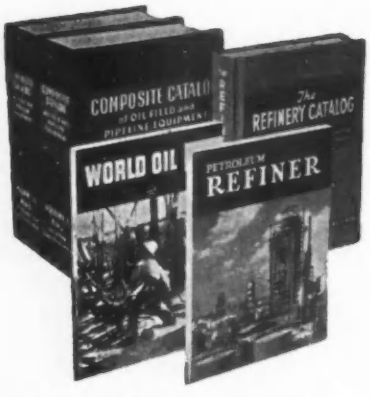
PIPE LINE ARTICLES

☐ **U. S. Pipe Lines.** Expansion will continue rapidly, although new construction will be at least 10 percent below the 1953 level. WORLD OIL predicts that 16,200 miles of new lines will be laid this year, compared with 17,980 miles in 1953. There will be about 8700 miles of new gas lines this year. Definitely scheduled are 2411 miles of new products lines, with an additional 880 miles planned and likely to be laid. An estimated 1500 miles of crude oil gathering systems and 2200 miles of trunk lines will be constructed. **Page 199.**

INTERNATIONAL ARTICLES

☐ **World Crude Reserves.** The estimated total is up about 22 billion barrels over the 1952 figure. Present estimated reserves of 136,877,482,000 barrels reflect major discoveries and some large upward revisions of previous estimates in the light of additional information. The sharp increase is limited largely to the Middle East, which is estimated to have 79,075,000,000 barrels, or almost 60 percent of the world total. **Page 217.**

☐ **World Crude Production.** Output will increase by more than 600,000 barrels daily, or nearly 5 percent, during 1954, WORLD OIL predicts. This would put world production up to almost 5 billion barrels for the year and above 13.5 million barrels per day on the average. Thus, world crude production has almost doubled since the end of World War II, and now either the U. S. or the remainder of the world is almost equaling early postwar output for the whole world. **Page 220.**



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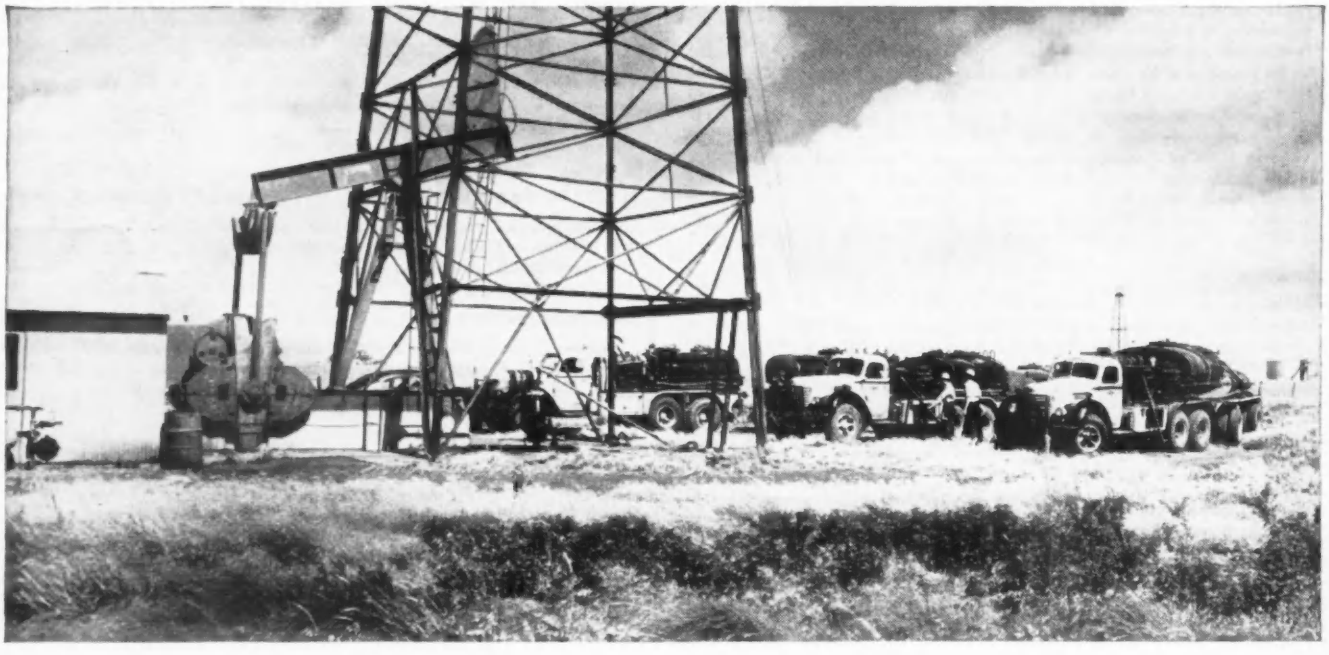
PRODUCTION INCREASED FROM 60 TO 450 BOPD WITH XM ACID

DOWELL XM Acid treatment boosted production after ordinary acid failed to improve flow



This new oil well had been completed in a dolomitic limestone formation. Ordinary acid had failed to improve production from this and neighboring wells. A trace of emulsion and incomplete return of the spent acid suggested that effective permeability had been reduced by swollen silicates plugging the pore spaces.

The operator decided to employ a Dowell treatment using XM Acid to control silicate swelling and increase production. As a result, production went from 60 to 450 BOPD and the XM Acid treatment resulted in a quick kick-off and clean-up for the operator.

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Don't Be Alarmed

A wave of pessimism is sweeping the U. S. One constantly hears business ahead is to be bad, to watch for a recession if not a depression. Many industries are "down-in-the-mouth" because of anticipating slightly less business. They are forgetting that anticipated activities call for the second, third or fourth most active year in history, and that predicted volumes of business are far above most years.

This thinking has entered the oil business. Contrary to such thoughts, the petroleum industry has no basic cause for fear or alarm. Oil is even overlooking that an all-time peak is expected in consumption, production and other activities in 1954.

•

Several economic problems, it is true, confront the oil business in 1954. Heavy crude production cuts have been experienced in recent months, especially in Texas. However, curtailed production has reduced crude surpluses and supplies are in good shape again.

The main problem is that of surplus gasoline. The motor fuel market has softened under the influence of excessive stocks, and threatens to weaken the crude oil market. This, too, can be cured. The surplus is the result of excessive operations, consumption being at an all-time high. Reduced refinery runs would solve the problem. If refinery operations are not curtailed, the industry will have only itself to blame.

•

Business must guard against bringing a depression on itself, as did the man who sold hot dogs. He started advertising how good they were. He asked people to buy his hot dogs. People bought, and his business expanded to the point he brought his son home from college to help him.

Shortly thereafter, his son said: "Father, we are headed for a big depression. The European situation is terrible. The domestic situation is worse. Everything is going to pot."

Whereupon, they stopped advertising and no longer sent salesmen out to sell hot dogs. Business fell off almost overnight. "You were right, son," remarked the father a few weeks later, "We certainly are in the middle of a great depression."

At the same time, meat packers were reporting national sales of hot dogs had risen to a new peak.

•

Another busy year is ahead of oil and gas in 1954. The industry must continue its expansion. Many operations will expand to new highs to satisfy continued growth in consuming rates.

Despite recent reductions and higher imports, U. S. crude production in 1954 is expected to be at an all-time high. True, the rate of growth is likely to be smaller than in previous years. On the other hand, natural gas production again will show a phenomenal gain. Greater production will necessitate extensive drilling and exploratory operations. More producing wells must be operated, and additional pipe line capacity constructed. So, equipment sales will be heavy.

The longer range viewpoint also is favorable. Consumption of both oil and gas shows every sign of continuing to climb to new peaks for years to come. Within five years the demand for U. S. oils probably will be 1½ million barrels per day higher than today, nearly one-fifth larger than in 1953. Despite further growth in imports, the U. S. will still need to produce larger quantities of oil to supply enlarged demand. Five years hence marketed production of natural gas may be 3½ trillion cubic feet greater per year, one-third higher than currently.

•

There is little to complain about or to fear as long as the industry's operations continue to climb to new peaks. This is true even if the rate of growth is small.

Reduced rates of gain must be viewed as constituting the industry's return to more normal rates of growth, following the abnormal war and earlier postwar years. It must also be recalled that before the war the industry normally operated with more than enough oil to go around, and was able to successfully operate under such conditions. It can be done again.

Warren L. Baker

They drill out faster because they are *skillfully designed to break up readily* under the drilling bit. • Consideration was given to "drillability" in the design of every part. • Furthermore, they are . . .

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contact any of these
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McCULLOUGH TOOL COMPANY
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SET ON WIRE LINE

Any of the leading service organizations (listed at left) can set a Baker Bridge Plug and gun-perforate on the same trip to the well. Wire line setting is so much faster than setting on tubing that the saving (particularly in deeper wells) is very much worth while.

CHOICE OF PLUGS

It's easy to select the *right* bridge plug. First, specify BAKER—and *be sure you get Baker!* If the application is temporary, and no harmful well fluids are present, choose the MAGNESIUM ALLOY Type. If the application is permanent, or if severe well conditions are present, you need the CAST IRON Type.

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With a Baker Bridge Plug set in your casing, you can be sure—whether the plug is CAST IRON or MAGNESIUM—that the packing element will provide a leak-proof shut-off to hold against any pressure from above or below.

SPECIFIC RECOMMENDATIONS for using Baker Bridge Plugs are available from any Baker representative or office.

BAKER OIL TOOLS, INC. HOUSTON • LOS ANGELES • NEW YORK

BAKER BRIDGE PLUG

The Changing Panorama . . . WORLD OIL correctly foretold 1953 developments. Increased demand for all oils is significant factor in 1954 outlook.

THE PROBABLE course of events in the petroleum industry in 1954 is charted in detail in this, the annual Forecast-Review issue of WORLD OIL.

Articles, tables, and charts point out prospective trends in domestic and export demand for petroleum products and the drilling and other operations indicated as planned or likely in meeting the market requirements.

The issue also embodies extensive records of industry activities and operations in the past, which show what trends and patterns have been delineated heretofore.

Emphasis on Outlook. The whole issue places major emphasis on prospective developments, and it is therefore primarily a guide to the future, offering valuable help in planning future operations and undertakings.

In presenting forecasts and estimates, WORLD OIL has taken advantage of careful estimates made by government sources and also has conducted extensive surveys of its own. The forecasts are much more than guesses. They are careful estimates, worked out with the benefit of information from all available sources.

For Reference. While this annual issue is a dependable guide to the future, it is also one that merits keeping close at hand throughout the year for reference purposes. The issue can repeatedly answer questions about the oil and natural gas industries, being a gold mine of information on all phases of these industries. WORLD OIL editors regularly are called upon, time after time, to furnish information about oil and gas to men in these industries. A surprisingly great number of the inquiries are answered by referring to WORLD OIL's Forecast-Review issue.

Accuracy of Forecasts. The dependability of forecasts as offered in this annual issue is demonstrated by comparing some estimates of a year ago with actual results. Among the forecasts, for example, was that of the Bureau of Mines estimating that the total demand for all oils in 1953 would average 8 million barrels daily, an increase of 274,000 barrels or 3.5 percent. Actual total demand proved to be approximately 8,023,000 barrels daily, an increase of 311,000 barrels or 4.0 percent. The forecast missed the actual by about ¼ of 1 percent. It foretold with a high degree of accuracy the volume of all oils required, a predominant factor in industry operations.

Imports materially affect domestic producers. A year ago, it was forecast that total imports in 1953 would average 1,038,000 barrels daily, an increase of 85,000 barrels or 8.6. The forecast was fulfilled exactly. Total imports actually averaged 1,038,000 barrels daily.

Salient Statistics. To provide a quick, concise summary of important forecasts offered in this issue, WORLD OIL herewith presents on Pages 56 and 57 a double page table showing "Salient Annual Statistics of the U. S." The table shows the forecasts for 1954 and the indicated increases or decreases from 1953. It also shows how the actual results of 1953 compared with those of 1952. Thus a broad view of current and prospective trends is given.

Oil Use Still Rising. Probably the most significant of all factors in the economy of the petroleum industry is the total demand for all oils, as it is the factor determining the levels for virtually all industry operations. It is necessary to know the amount of oils to be needed in order to provide supplies accordingly, avoiding either shortages or serious surpluses.

It is of more than academic interest, therefore, to know that for 1954 the demand for all oils is expected to show a further normal increase. The total demand will increase 317,000 barrels daily or 3.9 percent in 1954, to 8,340,000 barrels daily, it is estimated. That is nearly the same as the increase of 311,000 barrels per day or 4.0 percent in 1953.

Smaller Production Gain. While that prospective increase of about 4 percent in the total demand for all oils is encouraging, it does not provide a sound basis for similarly increasing domestic crude production. After taking into consideration other pertinent factors, it is found that in 1954 U. S. crude production should be increased only about 97,000 barrels daily or 1.5 percent above 1953 output to an average of 6,556,000 barrels daily. If domestic crude production should be increased more than these amounts, it is indicated, there would be unnecessary and uneconomical additions to stocks of crude and/or refined products.

Stocks Excessive. The need for only a moderate increase in crude production in 1954 arises in part because both production and processing of crude were at higher levels than necessary in 1953. Crude stocks did not show any material net change in 1953, but stocks of refined products showed a net increase of over 46 million barrels, or 127,000 daily.

That large increase was not essential. Stocks of gasoline, distillate fuel oil, and other products became excessive to the point of causing weakness of markets for those oils and declines in prices. For 1954 no net increase in crude stocks is considered essential, and only an increase of 8 million barrels, or 22,000 a day, in all refined products stocks is acknowledged as reasonable.

Natural Gasoline. Besides the stocks situation, one factor holding down the need for crude production in 1954 will

be an indicated further increase in production of natural gasoline. The higher demand for oils will be supplied in part by larger output of that resource. To the extent that natural gasoline production increases, the gain in need for crude will be limited. U. S. production of natural gasoline and allied products will increase by 45,000 barrels daily or 6.7 percent to 710,000 a day in 1954, it is estimated. That is a relatively larger gain than the needed increase of 97,000 barrels daily or 1.5 percent for crude oil.

However, there is danger of overproduction of natural gasoline as well as crude. There was, in fact, too much production of natural gasoline in 1953. The market for natural gasoline remains weak in early 1954, and it is indicated that average prices of that product may be lower than last year.

Imports to Rise More. A third reason why the essential increase in U. S. crude production in 1954 will be less than the increase in demand for oils is a prospective further increase in imports.

In 1954, total imports are expected to average 1,096,000 barrels daily, an increase of 58,000 a day or 5.6 percent, compared with the prospective rise of

Salient Annual Statistics of the United States

ITEM	THOUSANDS OF BARRELS, EXCEPT AS NOTED				
	1952	1953	Percent Change '52-'53	1954 Forecast	Percent Change '53-'54
Total Demand, All Oils	**2,822,595**	**2,928,530**	**+ 3.8**	**3,044,000**	**+ 3.9**
(Daily Average)	7,712	8,023	+ 4.0	8,340	+ 3.9
Motor Fuel Demand	1,193,565	1,265,176	+ 6.0	1,325,000	+ 4.7
(Daily Average)	3,261	3,466	+ 6.3	3,630	+ 4.7
Kerosine Demand	132,546	126,941	— 4.2	136,000	+ 7.1
(Daily Average)	362	348	— 3.9	373	+ 7.1
Residual Fuel Oil Demand	582,866	586,272	+ 0.6	581,000	— 0.9
(Daily Average)	1,592	1,606	+ 0.9	1,592	— 0.9
Distillate Fuel Oil Demand	512,862	522,610	+ 1.9	580,000	+11.0
(Daily Average)	1,401	1,432	+ 2.2	1,589	+11.0
Lubricating Oils Demand	54,196	53,237	— 1.8	52,877	— 0.4
(Daily Average)	148	146	— 1.4	145	— 0.4
Domestic Demand, Total	**2,662,876**	**2,783,029**	**+ 4.5**	**2,931,000**	**+ 5.3**
(Daily Average)	7,276	7,625	+ 4.8	8,030	+ 5.3
Exports, Total	**159,719**	**145,501**	**— 8.9**	**113,000**	**—22.3**
(Daily Average)	436	398	— 8.7	310	—22.3
Crude Oil Exports	26,727	19,921	—25.5	12,000	—39.8
(Daily Average)	73	54	—26.0	33	—39.8
Refined Oil Exports	132,992	125,580	— 5.6	101,000	—19.6
(Daily Average)	363	344	— 5.2	277	—19.6
Crude Runs to Stills, Total	**2,441,259**	**2,556,474**	**+ 4.7**	**2,611,940**	**+ 2.2**
(Daily Average)	6,670	7,004	+ 5.0	7,156	+ 2.2
Demand for Crude, Total	**2,483,282**	**2,592,943**	**+ 4.4**	**2,642,940**	**+ 1.9**
(Daily Average)	6,785	7,104	+ 4.7	7,241	+ 1.9
Demand for Domestic Crude	2,276,691	2,359,875	+ 3.7	2,392,940	+ 1.4
(Daily Average)	6,221	6,465	+ 3.9	6,556	+ 1.4
Crude Oil Production	**2,289,836**	**2,357,481**	**+ 3.0**	**2,393,000**	**+ 1.5**
(Daily Average)	6,256	6,459	+ 3.2	**6,556**	+ 1.5
Value at Wells, $ per Thousand	5,785,230	6,294,475	+ 8.8	6,652,540	+ 5.7
Average Value, $ per Barrel	2.53	2.67	+ 5.5	2.78	+ 4.1
Imports, All Oils	**348,507**	**378,812**	**+ 8.7**	**400,000**	**+ 5.6**
(Daily Average)	952	1,038	+ 9.0	1,096	+ 5.6
Crude Oil Imports	209,591	235,088	+12.2	250,000	+ 6.3
(Daily Average)	573	644	+12.4	685	+ 6.3
Refined Products Imports	138,916	143,724	+ 3.5	150,000	+ 4.4
(Daily Average)	379	394	+ 3.9	411	+ 4.4
Stocks End of Year, All Oils	**673,754**	**724,367**	**+ 7.5**	**732,367**	**+ 1.1**
Crude Oil Stocks	271,928	271,554	— 0.1	271,554	.....
Natural Gasoline Stocks	7,807	12,269	+57.2	12,269	.....
Refined Products Stocks	394,019	440,544	+11.8	448,544	+ 1.8
Motor Fuel Stocks	135,599	162,670	+20.0	.....	.....
Kerosine Stocks	26,842	29,415	+ 9.6	.....	.....
Residual Fuel Oil Stocks	48,706	49,542	+ 1.7	.....	.....
Distillate Fuel Oil Stocks	99,582	115,666	+16.1	.....	.....
Lubricating Oil Stocks	11,021	10,426	— 5.4	.....	.....

97,000 daily or 1.5 percent in domestic crude production.

Crude Runs to Stills. To avoid excessive stocks of products, refiners in 1954 will need to hold down crude runs to stills. Market demand can be supplied with refinery runs averaging 7,156,000 barrels daily, an increase of 152,000 barrels or 2.2 percent over 1953. The runs in 1953, averaging 7,004,000 barrels daily, were 334,000 a day or 5.0 percent above 1952 and resulted in excessive additions to stocks of refined products.

More Drilling Foreseen. WORLD OIL editors forecast that an unprecedented 49,564 new wells will be drilled in 1954, an increase of 525 wells or 1.1 percent over 1953. On average, the wells will be deeper, too, and the amount of footage drilled will increase about 5 percent, it is estimated.

The forecast also indicates that the industry will continue to increase wildcatting relatively more than development drilling. Wildcats to be drilled in 1954 are estimated at 11,167, an increase of 492 wells or 4.6 percent over 1953. The additional wildcats would account for nearly all of the increase in drilling, with completions of development wells showing only a nominal gain.

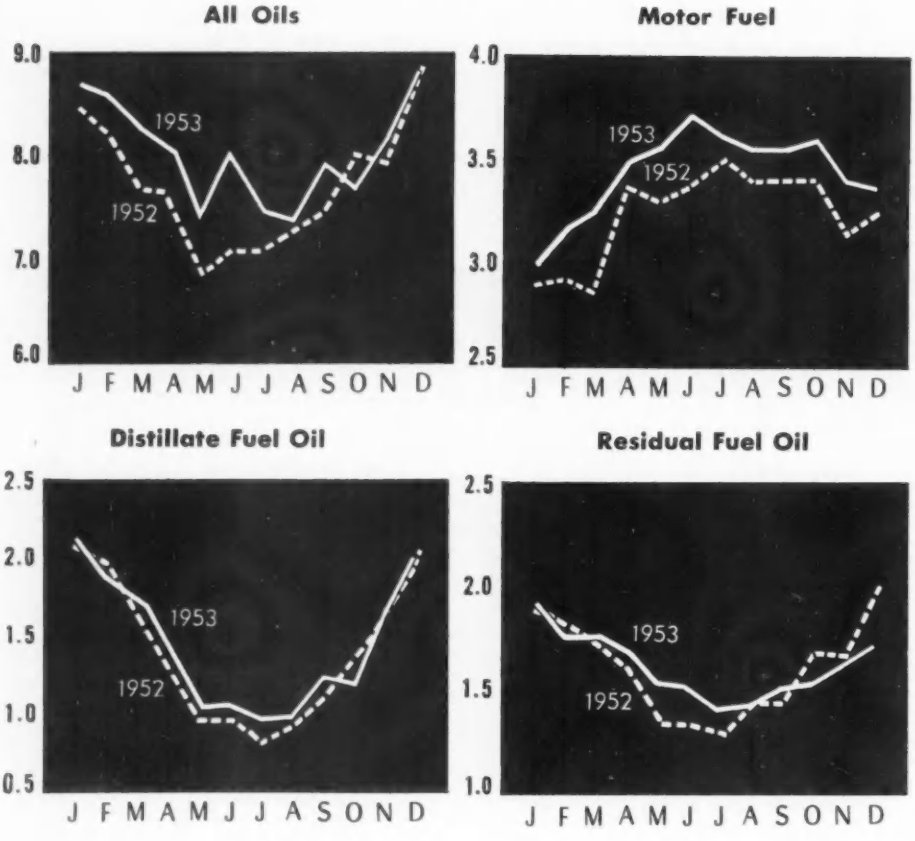
Salient Annual Statistics of the United States

ITEM	NUMBER, EXCEPT AS NOTED				
	1952	1953	Percent Change '52-'53	1954 Forecast	Percent Change '53-'54
Natural Gasoline Production, Thousand Bbls.	**223,515**	**242,363**	**+ 8.4**	**259,000**	**+ 6.9**
(Daily Average)	611	664	+ 8.7	710	+ 6.9
Nat'l. Gas Marketed Production, Bln. cu. Ft.	**8,003**	**8,700**	**+ 8.7**	**9,000**	**+ 3.4**
Value at Consumpt'n Points, ¢ per M. cu. ft.	33.2	35.3	+ 6.3	36.8	+ 4.2
Value at Wells, ¢ per M. cu. ft.	7.8	8.3	+ 6.4	8.8	+ 6.0
Pipe Line Construction, Miles	**13,247**	**17,980**	**+ 35.7**	**16,200**	**— 9.7**
Oil Lines Completed, Miles	4,363	4,650	+ 6.6	3,700	—18.3
Gas Lines Completed, Miles	7,188	9,890	+ 37.6	8,700	—12.0
Product Lines Completed, Miles	1,696	3,440	+102.8	3,800	+11.8
Crude Reserves, Year-End, Million Bbls.	**27,961**	**29,007**	**+ 3.7**	.....	.....
New Crude Reserves Proved, Million Bbls.	**2,749**	**3,370**	**+ 22.6**	.....	.....
New Fields and Pays Found	**1,652**	**1,914**	**+ 15.9**	.....	.....
New Oil Discoveries	**1,294**	**1,464**	**+ 13.1**	.....	.....
New Fields	982	1,080	+ 10.0	.....	.....
New Pays	312	384	+ 23.1	.....	.....
New Gas Discoveries	**223**	**294**	**+ 31.8**	.....	.....
New Fields	174	244	+ 40.2	.....	.....
New Pays	49	50	+ 2.0	.....	.....
New Distillate Discoveries	**135**	**156**	**+ 15.6**	.....	.....
New Fields	111	97	— 12.6	.....	.....
New Pays	24	59	+145.8	.....	.....
Strict Wildcats Drilled	**10,239**	**10,675**	**+ 4.3**	**11,167**	**+ 4.6**
Productive	1,267	1,421	+ 12 2	.....	.....
Non-Productive	8,972	9,254	+ 3.1	.....	.....
Well Completions, Total	**47,046**	**49,525**	**+ 5.3**	.....	.....
New Wells, Total	46,509	49,039	+ 5.4	49,564	+ 1.1
Oil Wells	23,371	25,323	+ 8.4	.....	.....
Gas Wells	3,345	3,594	+ 7.4	.....	.....
Distillate Wells	348	374	+ 7.5	.....	.....
Dry Holes	18,211	18,449	+ 1.3	.....	.....
Input and Disposal Wells	1,234	1,199	— 2.8	.....	.....
Old Wells, Drilled Deeper	537	486	— 9.5	.....	.....
Footage Drilled, Thousand Feet	**188,865**	**196,875**	**+ 4.2**	.....	.....
Footage Drilled, New Wells, Thousand Feet	188,378	196,466	+ 4.3	206,539	+ 5.1
Wells Drilling, End of Year	**4,649**	**4,802**	**+ 3.3**	.....	.....
Producing Oil and Condensate Wells, Yr. End	**493,258**	**506,186**	**+ 2.6**	.....	.....
Oil Wells Producing	489,822	501,859	+ 2.5	.....	.....
On Artificial Lift	432,375	442,394	+ 2.3	.....	.....
Flowing Oil Wells	57,447	59,465	+ 3.5	.....	.....
Condensate Wells Producing	3,436	4,327	+ 25.9	.....	.....

Total Demand for Oils, by Months, 1952 and 1953

(Including both domestic and export demand supplied by U. S. petroleum industry.)

MILLIONS OF BARRELS DAILY



Supply and Demand . . . Greater output of U. S. crude and natural gasoline required.

By L. J. LOGAN, World Oil Staff

Producers will have a market for 6,556,000 barrels of domestic crude production per day in 1954, an increase of 97,000 barrels daily or 1.5 percent over actual production in 1953. This is the calculation of the U. S. Bureau of Mines, in its annual forecast of demand for petroleum and products.

The prospective increase in crude output is smaller than that recorded in 1953. The 1953 production averaged 6,459,000 barrels daily, an increase of 203,000 barrels or 3.2 percent over 1952.

The predicted increase in requirements of domestic crude production in 1954 will be less than the expected gain in total demand for all oils. There is forecast a market for 8,340,000 barrels per day of all oils in 1954, an increase of 317,000 barrels daily or 3.9 percent over 1953. The need for domestic crude production will be up less than those amounts for several reasons.

Market Outlook. In the first place, the market outlook for 1954 justifies no net increase in stocks of crude oil and only an increase of about 8 million barrels or 22,000 daily in the stocks of refined products. Such a handling of stocks would contrast with results in 1953, when stocks of crude were virtually unchanged but stocks of refined products showed a large net increase of 46,525,000 barrels, an average of 127,000 barrels daily. While all the crude produced in 1953 was used up as such, a large volume was converted into refined products which were not consumed but only went into storage.

Stocks of gasoline, distillate fuel oil, and some other products were increased more than necessary, and the surpluses have tended to depress product prices and to jeopardize crude prices. Only a comparatively small further net increase in stocks of refined products is indicated to be desirable. If production is determined accordingly, it will show only a small increase over the unnecessarily high output of 1953.

A second reason why crude production will not need to increase as much as the prospective gain in demand for all oils is that natural gasoline will become relatively more important in supplying the total demand. Production of that resource is expected to average 710,000 barrels daily in 1954, an increase of 45,000 barrels or 6.7 percent over 1953, compared with the projected gain of 97,000 daily or 1.5 percent for crude.

Finally, an increased percentage of the demand for oils is expected to be supplied by imports in 1954, despite the continued rise of imports in 1953. For 1954 it is predicted that total imports will average 1,096,000 barrels daily, an increase of 58,000 a day or 5.6 percent over 1953. The 1953 imports had averaged 1,038,000 barrels daily, exactly fulfilling the Bureau of Mines forecast of a year ago. That amount was 86,000 barrels daily or 9.0 percent more than imports in 1952. The estimated imports of 1954 would supply 13.1 percent of the total demand for all oils, whereas imports of 1953 supplied 12.9 percent. Predicted crude imports of 685,000 barrels daily would be up 41,000 barrels or 6.3 percent over 1953, and product imports of 411,000 daily would be up 17,000 barrels or 4.4 percent.

Crude runs to stills to be required in 1954 will average 7,156,000 barrels daily, an increase of 152,000 bar-

U. S. Petroleum Supply and Demand

(Source: Data from U. S. Bureau of Mines, except November and December, 1953, estimated by WORLD OIL.)

THOUSANDS OF BARRELS DAILY

YEAR	SUPPLY				DEMAND		
	U. S. Prod. All Oils[1]	Total Imports[2]	Total New Supply	Change in Stocks All Oils[3]	Domestic Demand[4]	Exports and Shipments[5]	Total Demand
1936	3,128	156	3,284	— 62	2,986	360	3,346
1937	3,647	157	3,804	+126	3,205	473	3,678
1938	3,472	149	3,621	— 25	3,115	531	3,646
1939	3,614	162	3,776	—115	3,373	518	3,891
1940	3,858	229	4,087	+106	3,625	356	3,981
1941	4,073	266	4,339	— 30	4,071	298	4,369
1942	4,034	99	4,133	—160	3,972	321	4,293
1943	4,372	174	4,546	— 33	4,168	411	4,579
1944	4,864	252	5,116	— 17	4,562	571	5,133
1945	5,010	311	5,321	— 37	4,857	501	5,358
1946	5,073	377	5,450	+119	4,912	419	5,331
1947	5,451	437	5,888	— 14	5,451	451	5,902
1948	5,921	514	6,435	+292	5,775	368	6,143
1949	5,477	645	6,122	— 8	5,803	327	6,130
1950	5,906	850	6,756	— 55	6,507	304	6,811
1951	6,720	844	7,564	+ 89	7,053	422	7,475
1952	6,868	952	7,820	+108	7,276	436	7,712
1953	7,124	1,038	8,162	+139	7,625	398	8,023
1954 Est.	7,266	1,096	8,362	+ 22	8,030	310	8,340

[1] Includes crude oil, natural gasoline, related products, and benzol. [2] Includes both refined and crude oil. [3] Includes changes in both refined and crude oil stocks. Minus signs indicate decreases and plus signs increases. [4] Includes military and civilian demand in continental United States and shipments to U. S. armed forces abroad. [5] Includes shipments to non-contiguous territories.

rels or 2.2 percent over 1953. This rise will be substantially smaller than the expected gain of 317,000 barrels daily or 3.9 percent in total demand for all oils, because of not repeating the 1953 over-expansion of refined product stocks, more production of natural gasoline, and higher imports of refined products.

The market outlook for U. S. crude as described above is indicated by prospective domestic and export demand for the various petroleum products, including motor fuel, kerosine, distillate fuel oil, residual fuel oil, and other items.

The predicted increase of 317,000 barrels per day or 3.9 percent in total demand for all oils, to 8,340,000 daily in 1954, would be nearly the same as the gains recorded in the past two years. Demand for all oils averaged 8,023,000 barrels daily in 1953, an increase of 311,000 daily or 4.0 percent. It averaged 7,712,000 a day in 1952, up 237,000 barrels or 3.2 percent.

Exports Decline. The prospective increase in total demand will be held down by further loss of export business, which showed a decrease during the past year. Total exports in 1954 will average 310,000 barrels daily, a decrease of 88,000 barrels or 22.3 percent, it is estimated.

That would almost duplicate the post-war low of 305,000 barrels daily set in 1950, after which exports recovered some in 1951 and 1952. Crude oil exports are virtually vanishing. They are estimated at only 33,000 barrels daily for 1954, down about 40 percent from the 54,000 daily of 1953 and comparing with 73,000 a day in 1952. Refined product exports are estimated at 277,000 barrels daily in 1954, a decrease of 67,000 barrels or 19.6 percent. The 1953 product exports of 344,000 barrels daily were off only 19,000 barrels or 5.2 percent from 1952.

Domestic demand for all oils will average 8,030,000 barrels daily in 1954, it is forecast. That would be a little more than the total (domestic and export) demand in 1953. It would be 405,000 barrels a day or 5.3 percent more than domestic demand of 1953. This increase would be similar to that recorded last year. The 1953 domestic demand of 7,625,000 barrels daily was 349,000 barrels or 4.8 percent more than in 1952. These increases of around 5 percent per year for 1953 and 1954 are about normal, although smaller than for some of the postwar years.

Of the prospective total demand for 8,340,000 barrels of oils per day in 1954, the expected total exports of 310,000 daily would represent only 3.7 percent and the domestic demand of 8,030,000 a day 96.3 percent.

Total demand for motor fuel will

Demand for All Oils, by Years

Total, domestic, and export demand supplied by U. S. petroleum industry.

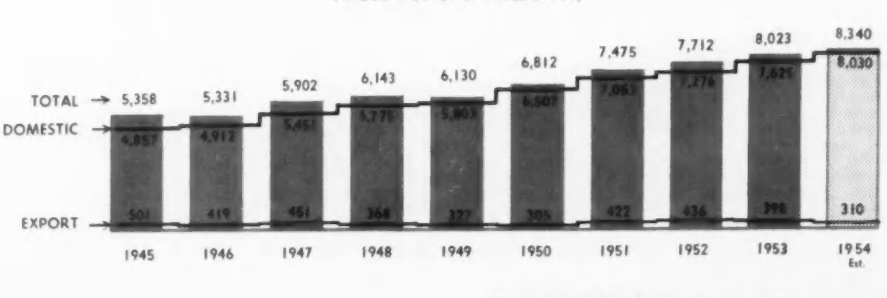
(Source: U. S. Bureau of Mines, except Nov.-Dec., 1953, estimated.)

THOUSANDS OF BARRELS

Year	Total Demand		Domestic		Exports	
	Annual	Daily	Total	Daily	Total	Daily
1918						
1919	438,434	1,201	374,541	1,026	63,893	175
1920	535,382	1,463	456,764	1,245	79,618	217
1921	592,402	1,450	457,521	1,253	71,881	197
1922	605,540	1,659	530,990	1,455	74,550	204
1923	754,361	2,067	652,027	1,786	102,334	280
1924	805,070	2,120	687,742	1,879	117,328	321
1925	840,818	2,304	726,797	1,991	114,021	312
1926	912,893	2,501	780,487	2,138	132,406	363
1927	944,762	2,588	802,499	2,199	142,263	390
1928	1,014,716	2,772	859,759	2,349	154,957	423
1929	1,103,203	3,022	940,083	2,576	163,120	447
1930	1,083,511	2,968	927,016	2,540	156,495	429
1931	1,027,274	2,814	902,920	2,474	124,354	341
1932	938,757	2,565	835,482	2,283	103,275	282
1933	975,214	2,672	868,487	2,379	106,727	292
1934	1,034,672	2,835	920,165	2,521	114,507	314
1935	1,112,672	3,048	983,685	2,695	128,987	353
1936	1,224,748	3,346	1,092,754	2,986	131,994	361
1937	1,342,516	3,678	1,169,682	3,205	172,834	473
1938	1,330,850	3,646	1,137,122	3,115	193,728	531
1939	1,420,035	3,890	1,231,067	3,373	188,959	518
1940	1,457,086	3,981	1,326,620	3,625	130,466	356
1941	1,594,609	4,369	1,485,779	4,071	108,830	298
1942	1,566,815	4,293	1,449,908	3,972	116,907	320
1943	1,671,383	4,579	1,521,426	4,168	149,957	411
1944	1,878,879	5,134	1,671,263	4,566	207,616	567
1945	1,955,668	5,358	1,772,685	4,857	182,983	501
1946	1,945,909	5,331	1,792,786	4,912	153,123	419
1947	2,154,280	5,902	1,989,803	5,451	164,477	451
1948	2,218,352	6,143	2,113,678	5,775	134,674	368
1949	2,237,626	6,130	2,118,250	5,803	119,376	327
1950	2,486,363	6,812	2,375,057	6,507	111,306	305
1951	2,728,465	7,475	2,574,413	7,053	154,052	422
1952	2,822,595	7,712	2,662,876	7,276	159,719	436
1953	2,928,530	8,023	2,783,029	7,625	145,501	398
1954 Est.	3,044,000	8,340	2,931,000	8,030	113,000	310

Demand for All Oils, by Years, 1945-1954

Total, domestic, and export demand supplied by U. S. petroleum industry.

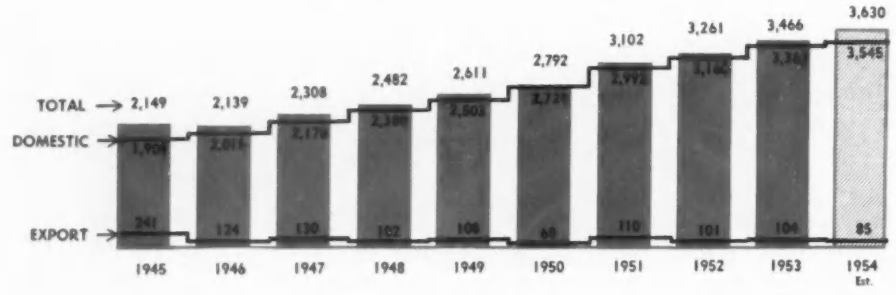


Demand for Principal Products, by Years, 1945-1954

(Total, domestic, and export demand supplied by U. S. petroleum industry)

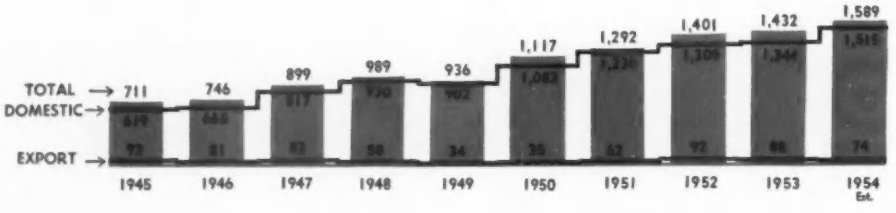
Motor Fuel

THOUSANDS OF BARRELS DAILY



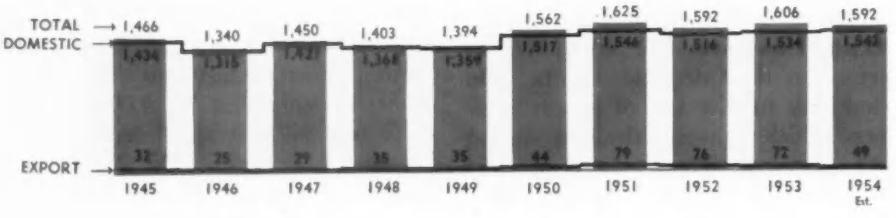
Distillate Fuel Oil

THOUSANDS OF BARRELS DAILY



Residual Fuel Oil

THOUSANDS OF BARRELS DAILY



Demand for Distillate Fuel, by Years

Total, domestic, and export demand supplied by U. S. petroleum industry.

(Source: U. S. Bureau of Mines, except Nov.-Dec., 1953, estimated.)

THOUSANDS OF BARRELS

Year	Total Demand		Domestic		Exports	
	Annual	Daily	Total	Daily	Total	Daily
1932	73,883	202	65,101	178	8,782	24
1933	76,172	209	64,748	177	11,424	31
1934	89,330	245	74,824	205	14,506	40
1935	102,277	280	86,028	236	16,249	44
1936	123,205	337	102,757	281	20,448	56
1937	146,970	403	116,841	320	30,129	82
1938	147,090	403	117,449	322	29,641	81
1939	166,993	457	134,973	370	32,020	88
1940	179,991	492	160,851	439	19,140	52
1941	189,749	520	172,824	473	16,925	46
1942	207,236	568	185,661	509	21,575	59
1943	233,067	639	208,110	570	24,957	68
1944	252,511	691	209,320	572	43,491	119
1945	259,580	711	226,084	619	33,496	92
1946	272,381	746	242,594	665	29,487	81
1947	328,150	899	298,273	817	29,877	82
1948	361,869	989	340,576	930	21,293	58
1949	341,573	936	329,278	902	12,295	34
1950	407,538	1,117	394,885	1,082	12,653	35
1951	471,657	1,292	449,102	1,230	22,555	62
1952	512,862	1,401	478,987	1,309	33,875	92
1953	522,610	1,432	490,577	1,344	32,033	88
1954 Est.	580,000	1,589	553,000	1,515	27,000	74

Demand for Residual Fuel Oil, by Years

Total, domestic, and export demand supplied by U. S. petroleum industry.

(Source: U. S. Bureau of Mines, except Nov.-Dec., 1953, estimated.)

THOUSANDS OF BARRELS

Year	Total Demand		Domestic		Exports	
	Annual	Daily	Total	Daily	Total	Daily
1932	250,268	684	239,056	653	11,212	31
1933	268,096	734	258,957	709	9,139	25
1934	279,646	766	265,547	727	14,099	39
1935	293,394	804	280,695	769	12,699	35
1936	322,319	881	307,884	841	14,435	39
1937	340,818	934	325,514	892	15,304	42
1938	309,753	849	291,833	799	17,920	49
1939	340,973	934	323,488	886	17,485	48
1940	356,272	973	340,163	929	16,109	44
1941	397,536	1,089	383,422	1,050	14,114	39
1942	417,792	1,145	405,697	1,111	12,095	33
1943	481,902	1,320	467,008	1,279	14,894	41
1944	524,556	1,433	512,020	1,399	12,536	34
1935	535,092	1,466	523,423	1,434	11,669	32
1946	489,217	1,340	480,029	1,315	9,188	25
1947	529,133	1,450	518,510	1,421	10,623	29
1948	513,554	1,403	500,543	1,368	13,011	35
1949	508,662	1,394	496,021	1,359	12,641	35
1950	570,021	1,562	553,793	1,517	16,228	44
1951	593,320	1,625	564,321	1,546	28,999	79
1952	582,866	1,592	554,945	1,516	27,921	76
1953	586,272	1,606	559,857	1,534	26,415	72
1954 Est.	581,000	1,592	563,000	1,542	18,000	49

average 3,630,000 barrels daily in 1954, according to the forecast. That would be an increase of 164,000 barrels or 4.7 percent over 1953. It would be a relatively smaller increase than that of the past year. The motor fuel demand in 1953 averaged 3,466,000 barrels daily, up 205,000 a day or 6.3 percent over 1952.

The prospective increase will be held down by an indicated decrease in exports. Those shipments are forecast at 85,000 barrels daily, down 19,000 a day or 18.2 percent from 1953, after increasing slightly during 1953. Domestic consumption of motor fuel in 1954 is forecast at 3,545,000 barrels daily, up 183,000 barrels or 5.4 percent. In 1953 it averaged 3,362,000 barrels per day, an increase of 202,000 barrels or 6.4 percent over 1952. U. S. consumption of motor fuel is now increasing less sharply than heretofore mainly because the number of motor vehicles in use is showing smaller annual gains.

Total demand for distillate fuel oil will average 1,589,000 barrels daily in 1954, an increase of 187,000 barrels or 11.0 percent over 1953, the forecast

Demand for Motor Fuel, by Years

Total, domestic, and export demand supplied by U. S. petroleum industry.

(Source: U. S. Bureau of Mines, except Nov.-Dec., 1953, estimated.)

THOUSANDS OF BARRELS

Year	Total Demand		Domestic		Exports	
	Annual	Daily	Total	Daily	Total	Daily
1918	93,599	256	79,949	219	13,650	37
1919	97,790	268	88,648	243	9,142	25
1920	124,623	340	108,945	298	15,678	43
1921	130,203	357	116,840	320	13,363	37
1922	152,132	417	137,770	377	14,362	39
1923	195,556	536	174,462	478	21,094	58
1924	225,737	617	196,586	537	29,151	80
1925	264,429	724	232,745	638	31,684	87
1926	311,897	854	268,128	735	43,769	120
1927	350,318	960	305,367	837	44,951	123
1928	392,293	1,072	388,881	926	53,412	146
1929	444,937	1,219	328,878	1,049	62,059	170
1930	463,184	1,269	397,609	1,089	65,575	180
1931	453,559	1,243	407,843	1,117	45,716	125
1932	413,229	1,129	377,791	1,032	35,438	97
1933	409,815	1,123	380,494	1,042	29,321	80
1934	435,025	1,192	410,339	1,124	24,686	68
1935	465,423	1,275	434,810	1,191	30,613	84
1936	510,252	1,394	481,606	1,316	28,646	78
1937	557,658	1,528	519,352	1,423	38,306	105
1938	573,112	1,570	523,003	1,433	50,109	137
1939	600,147	1,644	555,509	1,522	44,638	122
1940	614,867	1,680	589,490	1,611	25,377	69
1941	694,588	1,903	667,505	1,829	27,083	74
1942	624,207	1,710	589,110	1,614	35,097	96
1943	619,815	1,698	568,238	1,557	51,577	141
1944	733,019	2,003	632,482	1,728	100,537	275
1945	784,392	2,149	696,333	1,908	88,059	241
1946	780,751	2,139	735,417	2,015	45,334	124
1947	842,464	2,308	795,015	2,178	47,449	130
1948	908,572	2,482	871,270	2,380	37,302	102
1949	953,060	2,611	913,713	2,503	39,347	108
1950	1,019,011	2,792	994,290	2,724	24,721	68
1951	1,132,087	3,102	1,091,951	2,992	40,136	110
1952	1,193,565	3,261	1,156,505	3,160	37,060	101
1953	1,265,176	3,466	1,227,276	3,362	37,900	104
1954 Est.	1,325,000	3,630	1,294,000	3,545	31,000	85

Demand for and Supply of All Oils, Crude Oil, Motor Fuel, Kerosine, Fuel Oils and Lubricants

(Sources: U. S. Bureau of Mines except November and December, 1953, from American Petroleum Institute.)

THOUSANDS OF BARRELS

ITEM	Year 1952	Year 1953	% Diff. '52-'53
ALL OILS			
Domestic Production, Total	2,513,733	2,600,331	+ 3.4
(Daily Average)	6,868	7,124	+ 3.7
Crude Petroleum	2,289,836	2,357,481	+ 3.0
(Daily Average)	6,256	6,459	+ 3.2
Natural Gasoline and Benzol	223,897	242,850	+ 8.4
(Daily Average)	612	665	+ 8.7
Imports, Total	348,507	378,812	+ 8.7
(Daily Average)	952	1,038	+ 9.0
Crude Petroleum	209,591	235,088	+ 12.2
(Daily Average)	573	644	+ 12.4
Refined Products	138,916	143,724	+ 3.5
(Daily Average)	379	394	+ 3.9
Changes in Stocks, All Oils	+39,645	+50,613	+ 27.7
(Daily Average)	+ 108	+ 139	+ 28.7
Stocks, Beginning of Period	634,109	673,754	+ 6.4
Crude Oil	255,783	271,928	+ 6.3
Refined Products	370,140	394,019	+ 6.5
Natural Gasoline	8,186	7,807	— 4.6
Stocks, End of Period	673,754	724,367	+ 7.5
(Days' Supply)	87.4	90.3	+ 3.3
Crude Oil	271,928	271,554	— 0.1
Refined Products	394,019	440,544	+ 11.8
Natural Gasoline	7,807	12,269	+ 57.2
Demand, Total	2,822,595	2,928,530	+ 3.8
(Daily Average)	7,712	8,023	+ 4.0
Exports, Total	159,719	145,501	— 8.9
(Daily Average)	436	398	— 8.7
Crude Petroleum, Total	26,727	19,921	— 25.5
(Daily Average)	73	54	— 26.0
Refined Products, Total	132,992	125,580	— 5.6
(Daily Average)	363	344	— 5.2
Domestic Demand, Total	2,662,876	2,783,029	+ 4.5
(Daily Average)	7,276	7,625	+ 4.8
CRUDE PETROLEUM			
Supply:			
Domestic Production, Total	2,289,836	2,357,481	+ 3.0
(Daily Average)	6,256	6,459	+ 3.2
Imports, Total	209,591	235,088	+ 12.2
(Daily Average)	573	644	+ 12.4
Change in Stocks	+16,145	— 374	.....
(Daily Average)	+ 44	— 1	.....
Domestic Crude	+13,145	—2,394	.....
Foreign Crude	+ 3,000	+2,020	— 32.7
Stocks, Beginning of Period	255,783	271,928	+ 6.3
Domestic Crude	250,480	263,625	+ 5.2
Foreign Crude	5,303	8,303	+ 56.6
Stocks, End of Period	271,928	271,554	— 0.1
(Days' Supply)	40.0	38.2	— 4.5
Domestic Crude	263,625	261,231	— 0.9
Foreign Crude	8,303	10,323	+ 24.3
Supply, Total	2,483,282	2,592,943	+ 4.4
(Daily Average)	6,785	7,104	+ 4.7
Demand:			
Runs to Stills, Total	2,441,259	2,556,474	+ 4.7
(Daily Average)	6,670	7,004	+ 5.0
Domestic Crude	2,235,198	2,323,278	+ 3.9
(Daily Average)	6,107	6,365	+ 4.2
Foreign Crude	206,061	233,196	+ 13.2
(Daily Average)	513	639	+ 24.6
Exports, Total	26,727	19,921	— 25.5
(Daily Average)	73	55	— 24.7
Transfers to Fuel Oil Stocks	9,048	7,745	— 14.4
(Daily Average)	25	21	— 16.0
Used as Fuel, and Losses	6,248	8,803	+ 40.9
(Daily Average)	17	24	+ 41.2
Demand, Total, All Crude	2,483,282	2,592,943	+ 4.4
(Daily Average)	6,785	7,104	+ 4.7
Domestic Crude	2,276,691	2,359,875	+ 3.7
(Daily Average)	6,221	6,465	+ 3.9
Foreign Crude	206,591	233,068	+ 12.8
(Daily Average)	564	639	+ 13.3
KEROSINE			
Production, Total	132,300	129,514	— 2.1
(Daily Average)	361	355	— 1.7
Percent Yield from Crude	5.4	5.1	— 5.6
Change in Stocks	—246	+2,573	.....
(Daily Average)	— 1	+ 7	.....
Stocks, Beginning of Period	27,088	26,842	— 0.9
Stocks, End of Period	26,842	29,415	+ 9.6
(Days' Supply)	74.1	84.5	+ 14.0
Demand, Total	132,546	126,941	— 4.2
(Daily Average)	362	348	— 3.9
Exports, Total	7,960	6,883	— 13.5
(Daily Average)	22	19	— 13.6
Domestic Demand	124,586	120,058	— 3.6
(Daily Average)	340	329	— 3.2

ITEM	Year 1952	Year 1953	% Diff. '52-'53
MOTOR FUEL			
Production, Total	1,192,097	1,291,920	+ 8.4
(Daily Average)	3,257	3,539	+ 8.7
Refinery Gasoline, Total	1,052,018	1,146,901	+ 9.0
(Daily Average)	2,874	3,142	+ 9.3
(Yield from Crude)	43.0	44.8	+ 4.2
Natural Gasoline, Etc.	223,515	242,363	+ 8.4
(Daily Average)	611	664	+ 8.7
Benzol	382	487	+ 27.5
Less sale of L.P.G.	79,708	87,075	+ 9.2
Less Transfers Cycle Prods.	4,110	4,070	— 1.0
Less Exports, Losses, Etc.	.....	6,686	.....
Imports, Total	1,761	327	— 81.4
(Daily Average)	5	1	— 80.0
Change in Stocks	+293	+27,071	.....
(Daily Average)	+ 1	+ 74	.....
Stocks, Beginning of Period	135,306	135,599	+ 0.2
Finished Gasoline	127,120	127,792	+ 0.5
Natural Gasoline	8,186	7,807	— 4.6
Stocks, End of Period	135,599	162,670	+ 20.0
(Days' Supply)	41.6	46.9	+ 12.7
Finished Gasoline	127,792	150,401	+ 17.7
Natural Gasoline	7,807	12,269	+ 57.2
Demand, Total	1,193,565	1,265,176	+ 6.0
(Daily Average)	3,261	3,466	+ 6.3
Exports, Total	37,060	37,900	+ 2.3
(Daily Average)	101	104	+ 3.0
Domestic Demand	1,156,505	1,227,276	+ 6.1
(Daily Average)	3,160	3,362	+ 6.4
DISTILLATE FUEL OIL			
Production, Total	520,378	532,591	+ 2.3
(Daily Average)	1,422	1,459	+ 2.6
Percent Yield from Crude	21.3	20.8	— 2.3
Transfers from Crude	2,705	1,996	— 26.2
(Daily Average)	7	5	— 28.6
Imports, Total	2,742	4,107	+ 49.8
(Daily Average)	7	11	+ 57.1
Change in Stocks	+12,963	+16,084	+ 24.1
(Daily Average)	+ 35	+ 44	+ 25.7
Stocks, Beginning of Period	86,619	99,582	+ 15.0
Stocks, End of Period	99,582	115,666	+ 16.1
(Days' Supply)	71.1	80.8	+ 13.6
Demand, Total	512,862	522,610	+ 1.9
(Daily Average)	1,401	1,432	+ 2.2
Exports, Total	33,875	32,023	— 5.4
(Daily Average)	92	88	— 4.3
Domestic Demand	478,987	490,577	+ 2.4
(Daily Average)	1,309	1,344	+ 2.7
RESIDUAL FUEL OIL			
Production, Total	453,897	447,576	— 1.4
(Daily Average)	1,240	1,226	— 1.1
Percent Yield from Crude	18.6	17.5	— 5.9
Transfers from Crude	6,343	5,749	— 9.4
(Daily Average)	17	16	— 5.9
Imports, Total	128,479	133,780	+ 4.1
(Daily Average)	351	367	+ 4.6
Change in Stocks	+5,853	+833	.....
(Daily Average)	+ 16	+ 3	.....
Stocks, Beginning of Period	42,853	48,706	+ 13.7
Stocks, End of Period	48,706	49,542	+ 1.7
(Days' Supply)	30.6	30.8	+ 0.7
Demand, Total	582,866	586,272	+ 0.6
(Daily Average)	1,592	1,606	+ 0.9
Exports, Total	27,921	26,415	— 5.4
(Daily Average)	76	72	— 5.3
Domestic Demand	554,945	559,857	+ 0.9
(Daily Average)	1,516	1,534	+ 1.2
LUBRICANTS			
Production, Total	55,600	52,642	— 5.3
(Daily Average)	152	144	— 5.3
Percent Yield from Crude	2.3	2.1	— 8.7
Change in Stocks	+1,404	—595	.....
(Daily Average)	+ 4	— 2	.....
Stocks, Beginning of Period	9,617	11,021	+ 14.6
Stocks, End of Period	11,021	10,426	— 5.4
(Days' Supply)	74.5	71.4	— 4.1
Demand, Total	54,196	53,237	— 1.8
(Daily Average)	148	146	— 1.4
Exports, Total	16,037	12,736	— 20.6
(Daily Average)	44	35	— 20.5
Domestic Demand	38,159	40,501	+ 6.1
(Daily Average)	104	111	+ 6.7

indicates. While this would be a sharp increase, it would be an abnormal gain, caused by unexpectedly low demand in 1953. The demand in 1953 averaged 1,432,000 barrels daily, an increase of only 31,000 a day or 2.2 percent over 1952. Holding down the use of heating oil in 1953 was the lingering of mild weather late in the year.

Kerosine demand shows trends similar to those for distillate fuel oil. Total demand for kerosine in 1954 will average 373,000 barrels daily, an increase of 25,000 a day or 7.1 percent. In 1953 it averaged 348,000 barrels per day, down 14,000 daily or 3.9 percent from 1952.

Total demand for residual fuel oil is forecast at 1,592,000 barrels per day in 1954, down 14,000 barrels or about 1 percent from 1953 and the same as in 1952.

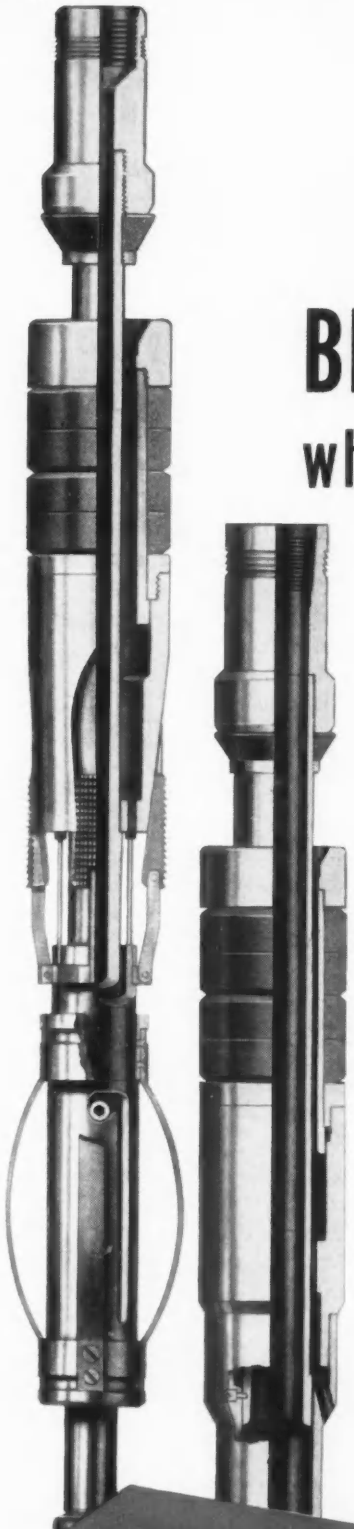
Forecast of Petroleum Demand and Supply in 1954, Compared with 1953 and 1952

(All data from U. S. Bureau of Mines except November and December, 1953, estimated with aid of American Petroleum Institute reports.)

THOUSANDS OF BARRELS

	ANNUAL COMPARISONS					1954 FORECAST BY QUARTERS			
	1952	1953	% Diff. '52-'53	1954 Forecast	% Diff. '53-'54	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
All Oils, Total Demand	**2,822,595**	**2,928,530**	**+ 3.8**	**3,044,000**	**+ 3.9**	**797,000**	**718,000**	**719,000**	**810,000**
(Daily Average)	7,712	8,023	+ 4.0	**8,340**	+ 3.9	8,856	7,890	7,815	8,804
Domestic Demand	2,662,876	2,783,029	+ 4.5	**2,931,000**	+ 5.3	768,000	686,000	691,000	786,000
(Daily Average)	7,276	7,625	+ 4.8	**8,030**	+ 5.3	8,533	7,538	7,511	8,543
Exports, Total	159,719	145,501	— 8.9	**113,000**	— 22.3	29,000	32,000	28,000	24,000
(Daily Average)	436	398	— 8.7	**310**	— 22.3	322	352	304	261
Crude Exports	26,727	19,921	— 25.5	**12,000**	— 39.8	3,000	3,000	3,000	3,000
(Daily Average)	73	54	— 26.0	**33**	— 39.8	33	33	33	33
Refined Exports	132,992	125,580	— 5.6	**101,000**	— 19.6	26,000	29,000	25,000	21,000
(Daily Average)	363	344	— 5.2	**277**	— 19.6	289	319	272	228
Motor Fuel, Total Demand	**1,193,565**	**1,265,176**	**+ 6.0**	**1,325,000**	**+ 4.7**	**295,000**	**347,000**	**353,000**	**330,000**
(Daily Average)	3,261	3,466	+ 6.3	**3,630**	+ 4.7	3,278	3,813	3,837	3,587
Domestic Demand	1,156,505	1,227,276	+ 6.1	**1,294,000**	+ 5.4	287,000	338,000	345,000	324,000
(Daily Average)	3,160	3,362	+ 6.4	**3,545**	+ 5.4	3,189	3,714	3,750	3,522
Exports	37,060	37,900	+ 2.3	**31,000**	— 18.2	8,000	9,000	8,000	6,000
(Daily Average)	101	104	+ 3.0	**85**	— 18.2	89	99	87	65
Kerosine, Total Demand	**132,546**	**126,941**	**— 4.2**	**136,000**	**+ 7.1**	**47,000**	**22,000**	**21,000**	**46,000**
(Daily Average)	362	348	— 3.9	**373**	+ 7.1	522	242	228	500
Domestic Demand	124,586	120,058	— 3.6	**131,000**	+ 9.1	46,000	20,000	20,000	45,000
(Daily Average)	340	329	— 3.2	**359**	+ 9.1	511	220	217	489
Exports	7,960	6,883	— 13.5	**5,000**	— 27.4	1,000	2,000	1,000	1,000
(Daily Average)	22	19	— 13.6	**14**	— 27.4	11	22	11	11
Distillate Fuel Oil, Total Demand	**512,862**	**522,610**	**+ 1.9**	**580,000**	**+ 11.0**	**197,000**	**109,000**	**99,000**	**175,000**
(Daily Average)	1,401	1,432	+ 2.2	**1,589**	+ 11.0	2,189	1,198	1,076	1,902
Domestic Demand	478,987	490,577	+ 2.4	**553,000**	+ 12.7	190,000	101,000	92,000	170,000
(Daily Average)	1,309	1,344	+ 2.7	**1,515**	+ 12.7	2,111	1,110	1,000	1,848
Exports	33,875	32,033	— 5.4	**27,000**	— 15.7	7,000	8,000	7,000	5,000
(Daily Average)	92	88	— 4.3	**74**	— 15.7	78	88	76	54
Residual Fuel Oil, Total Demand	**582,866**	**586,272**	**+ 0.6**	**581,000**	**— 0.9**	**165,000**	**134,000**	**127,000**	**155,000**
(Daily Average)	1,592	1,606	+ 0.9	**1,592**	— 0.9	1,833	1,473	1,380	1,685
Domestic Demand	554,945	559,857	+ 0.9	**563,000**	+ 0.5	160,000	129,000	123,000	151,000
(Daily Average)	1,516	1,534	+ 1.2	**1,542**	+ 0.5	1,778	1,418	1,337	1,641
Exports	27,921	26,415	— 5.4	**18,000**	— 31.9	5,000	5,000	4,000	4,000
(Daily Average)	76	72	— 5.3	**49**	— 31.9	56	55	43	43
***All Other Oils, Total Demand**	**400,756**	**427,531**	**+ 6.7**	**422,000**	**— 1.3**	**93,000**	**106,000**	**119,000**	**104,000**
(Daily Average)	1,095	1,171	+ 6.9	**1,156**	— 1.3	1,033	1,165	1,293	1,130
Domestic Demand	347,853	385,261	+ 10.8	**390,000**	+ 1.2	85,000	98,000	111,000	96,000
(Daily Average)	950	1,055	+ 11.0	**1,068**	+ 1.2	944	1,077	1,207	1,043
Exports	52,903	42,270	— 20.1	**32,000**	— 24.3	8,000	8,000	8,000	8,000
(Daily Average)	145	116	— 20.0	**88**	— 24.3	89	88	87	87
CHANGE IN STOCKS									
All Oils	**+39,645**	**+50,613**	**+ 27 7**	**+8,000**	.....	**—38,000**	**+31,000**	**+43,000**	**—28,000**
(Daily Average)	+108	+139	+ 28.7	**+22**	.....	—422	+341	+467	—304
Crude Oil	+16,145	—374	.....	.....	.....	.....	.....	.....	.....
(Daily Average)	+44	—1	.....	.....	.....	.....	.....	.....	.....
Natural Gasoline	—379	+4,462	.....	.....	.....	.....	.....	.....	.....
(Daily Average)	—1	+12	.....	.....	.....	.....	.....	.....	.....
Refined Products	+23,879	+46,525	+94.8	**+8,000**	.....	—38,000	+31,000	+43,000	—28,000
(Daily Average)	+65	+127	+95.4	**+22**	.....	—422	+341	+467	—304
NEW SUPPLY									
Total New Supply	**2,862,240**	**2,979,143**	**+ 4.0**	**3,052,000**	**+ 2.4**	**759,000**	**749,000**	**762,000**	**782,000**
(Daily Average)	7,820	8,162	+ 4.4	**8,362**	+ 2.4	8,433	8,231	8,283	8,500
Domestic Production, Total	**2,513,733**	**2,600,331**	**+ 3.4**	**2,652,000**	**+ 2.0**	**657,000**	**655,000**	**667,000**	**673,000**
(Daily Average)	6,868	7,124	+ 3.7	**7,266**	+ 2.0	7,300	7,198	7,250	7,315
Crude Oil	2,289,836	2,357,481	+ 3.0	**2,393,000**	+ 1.5	593,000	592,500	602,500	605,000
(Daily Average)	6,256	6,459	+ 3.2	**6,556**	+ 1.5	6,589	6,511	6,549	6,576
Other Oils	223,897	242,850	+ 8.4	**259,000**	+ 6.7	64,000	62,500	64,500	68,000
(Daily Average)	612	665	+ 8.7	**710**	+ 6.7	711	687	701	739
Imports, Total	**348,507**	**378,812**	**+ 8.7**	**400,000**	**+ 5.6**	**102,000**	**94,000**	**95,000**	**109,000**
(Daily Average)	952	1,038	+ 9.0	**1,096**	+ 5.6	1,133	1,033	1,033	1,185
Crude Oil	209,591	235,088	+ 12.2	**250,000**	+ 6.3	57,000	61,000	65,000	670,000
(Daily Average)	573	644	+ 12.4	**685**	+ 6.3	633	670	707	728
Refined Products	138,916	143,724	+ 3.5	**150,000**	+ 4.4	45,000	33,000	30,000	42,000
(Daily Average)	379	394	+ 3.9	**411**	+ 4.4	500	363	326	457
Crude Oil Runs to Stills, Total	**2,441,259**	**2,556,474**	**+ 4.7**	**2,611,940**	**+ 2.2**	**642,420**	**645,372**	**659,732**	**664,516**
(Daily Average)	6,670	7,004	+ 5.0	**7,156**	+ 2.2	7,138	7,092	7,171	7,223
Demand for Crude Oil, Total	**2,483,282**	**2,592,943**	**+ 4.4**	**2,642,940**	**+ 1.9**	**650,010**	**653,501**	**667,508**	**671,992**
(Daily Average)	6,785	7,104	+ 4.7	**7,241**	+ 1.9	7,222	7,181	7,256	7,304
Domestic Crude Demand	2,276,691	2,359,875	+ 3.7	**2,392,940**	+ 1.4	593,010	592,501	602,508	604,992
(Daily Average)	6,221	6,465	+ 3.9	**6,556**	+ 1.4	6,589	6,511	6,549	6,576
Foreign Crude Demand	206,591	233,068	+ 12.8	**250,000**	+ 7.2	57,000	61,000	65,000	67,000
(Daily Average)	564	639	+ 13.3	**685**	+ 7.2	633	670	707	728

* Includes crude oil used as fuel and lost in handling, liquefied gases, petroleum coke, asphalt, road oil, etc., and refinery losses.



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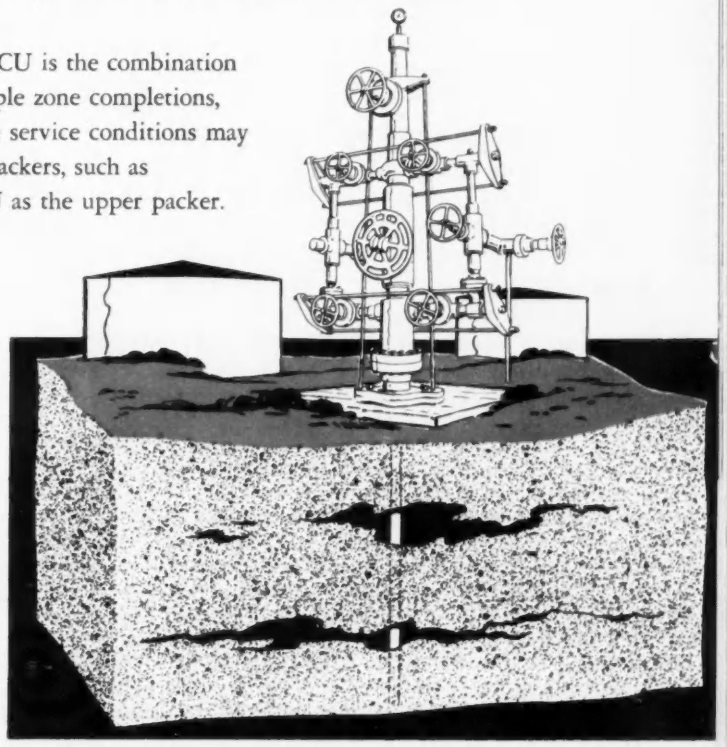

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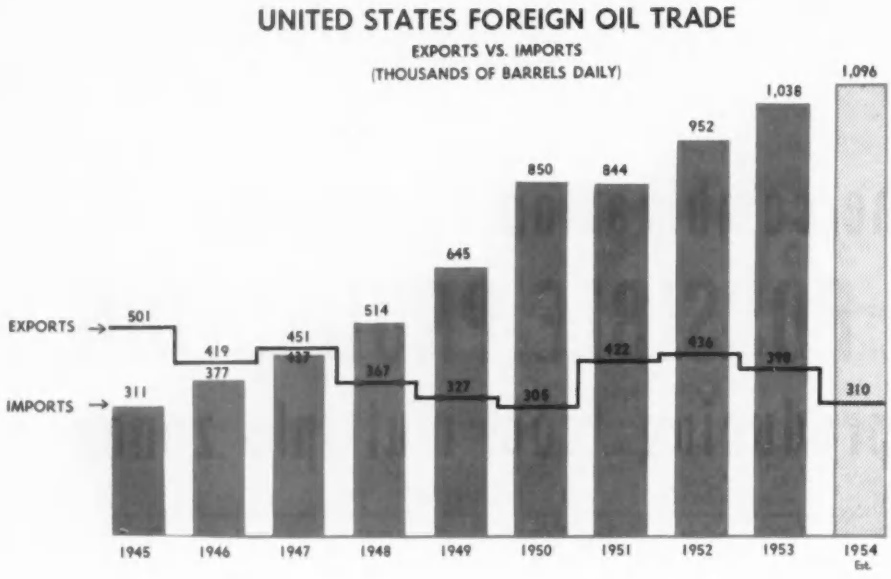


Exports and Imports . . . Pattern of rising dependence on imported oils to continue.

By ROBERT E. SPANN, World Oil Staff

The U. S. will have a rising dependence on imported petroleum over the next few years as an outgrowth of the expansion of oil production abroad, particularly in the Middle East, and the surplus of ocean tankers and resulting low shipping rates. At the same time, the need for U. S. petroleum exports can be expected to continue to decline.

The nation has been a net importer of crude oil and refined products since 1947, and the margin of imports over exports has widened each year. There are no present indications that this pattern will change in the immediate future years. The market for U. S. crude oil exports is rapidly coming to an end with the completion last year of the all-year pipe line from Alberta to eastern Canadian refineries. Canada is approaching self sufficiency in petroleum and is becoming an exporter to the U. S. West Coast.

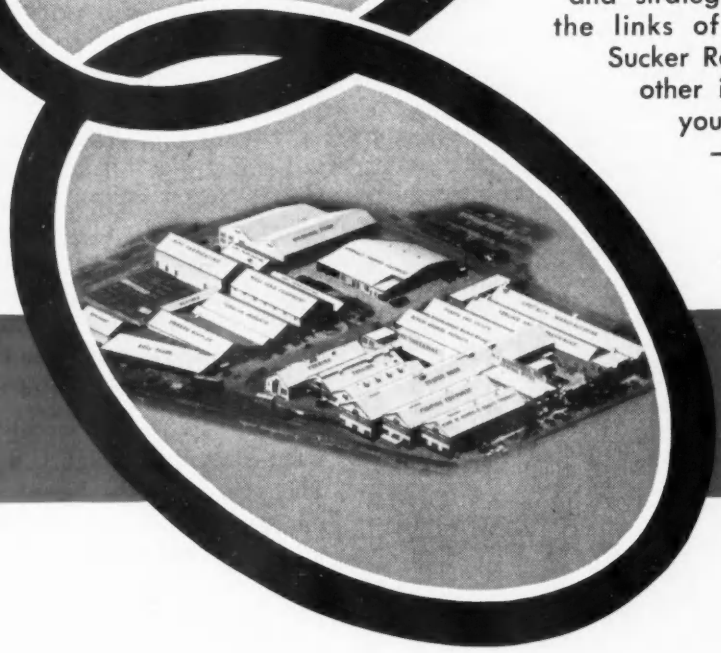
World need for U. S. refined petroleum products has declined steadily in the postwar years with the expansion of refinery capacity abroad. While in recent years there has been a strong demand for aviation gasoline and lubricants, erection of refining units abroad promises to reduce this market also.

Expansion limited. The pattern of growing imports and decreasing exports has limited the expansion of the domestic industry, and the continuation of the trend could produce more serious hardships in the form of a downturn in drilling rates and a resultant decline in additions to U. S. underground reserves of petroleum. The 1954 forecast of the U. S. Bureau of Mines places total demand at a 3.9 percent gain over 1953, but the demand for domestic crude oil is only expected to show a gain of 1.4 percent. Imports in 1954, according to this forecast, will increase by 5.6 percent to a new record of 1,096,000 barrels daily, while exports are expected to drop 22.3 percent from 1953 to an average of 310,000 barrels per day.

Middle East benefits. Continued increases in U. S. imports of petroleum have resulted from the fast growth of production in foreign areas, notably the Middle East, where the availability of petroleum has far outstripped the expansion in demand. While the Eastern Hemisphere is the primary market for Middle East oil, crude oil imports to the U. S. from the Middle East last year averaged 220,000 barrels daily, a rise of 42 percent over 1952, and such imports represented 21 percent of the total U. S. crude and product imports of 1,038,000 barrels daily.

While growth in production was the important factor in larger Middle East imports to the U. S., a sharp drop in world tanker rates, most favorable to Middle East producers, has played an almost equally important part. The large postwar tank ship construction program outpaced the demand for bottoms during 1952, and as the surplus of available ships mounted, rates plunged downward. The charter rates for foreign flag dirty tankers in 1952 averaged former U. S. Maritime Commission rates plus 50 percent for the Persian Gulf-U. S. East Coast movement, and in 1953 these rates dropped to USMC, minus 50 percent. Rates for foreign flag dirty tankers in the Caribbean to U. S. East Coast service in the same two years dropped from USMC plus 55 percent to USMC minus 34 percent, and the rates for American flag tankers on the U. S. Gulf to U. S. East Coast run declined from USMC plus 62 percent to USMC minus 28 percent.

In terms of delivered prices of crude oil, the sharp tanker rate decline means that currently Persian Gulf 36 gravity crude oil can be delivered to the U. S. East Coast (including duty) for $2.96 per barrel, (based on Ras Tanura posted prices). The delivered price of Venezuelan 36 gravity crude to the same destination is now $3.25 a barrel, and similar gravity crude from West Texas can be delivered for $3.26. Persian Gulf crude now has a 30 cents a barrel price advantage over West Texas oil on the



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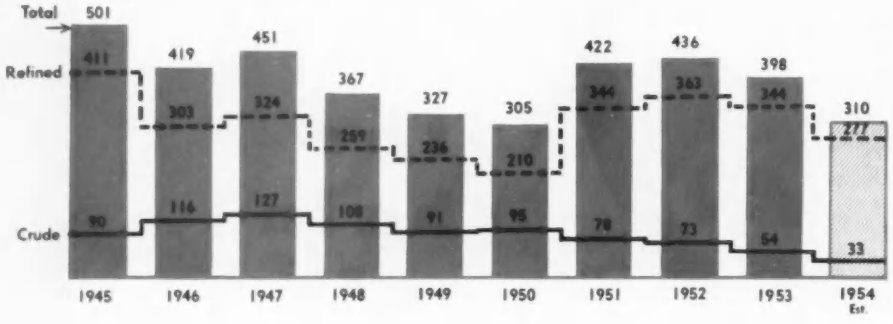
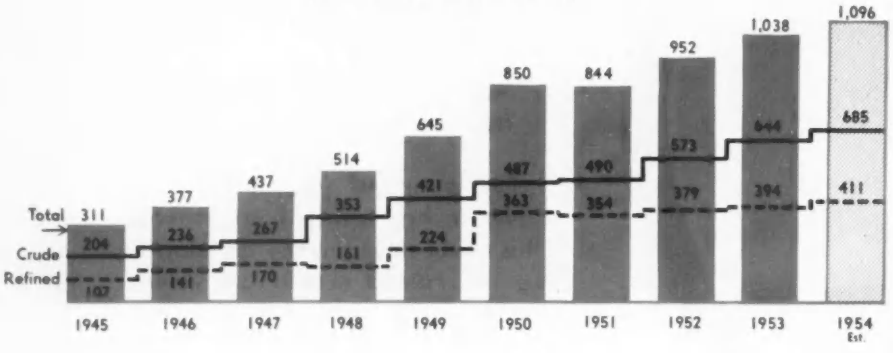
UNITED STATES OIL EXPORTS
(THOUSANDS OF BARRELS DAILY)



UNITED STATES OIL IMPORTS
(THOUSANDS OF BARRELS DAILY)



U. S. Exports of Crude Oil and Refined Products, by Years

(Source: Bureau of Mines, except Nov.-Dec., 1953, estimated.)

THOUSANDS OF BARRELS

YEAR	CRUDE Total	CRUDE Daily	REFINED Total	REFINED Daily	ALL OILS Total	ALL OILS Daily
1918	5,884	16	62,234	170	68,118	187
1919	6,348	17	57,545	158	63,893	175
1920	9,295	25	70,323	192	79,618	217
1921	9,527	26	62,254	171	71,881	197
1922	10,805	30	63,745	175	74,550	204
1923	17,534	48	84,800	232	102,334	280
1924	18,239	50	99,089	271	117,328	321
1925	13,337	36	100,684	276	114,021	312
1926	15,407	42	116,999	321	132,406	363
1927	15,844	43	126,419	346	142,263	390
1928	18,966	52	135,991	372	154,957	423
1929	26,401	72	136,719	375	163,120	447
1930	23,705	65	132,790	364	156,495	429
1931	25,535	70	98,819	271	124,354	341
1932	27,393	75	75,882	207	103,275	282
1933	36,584	100	70,143	192	106,727	292
1934	41,127	113	73,380	201	114,507	314
1935	51,430	141	77,557	212	128,987	353
1936	50,313	137	81,681	223	131,994	361
1937	67,234	184	105,600	289	172,834	473
1938	77,254	212	116,474	319	193,728	531
1939	72,076	197	116,883	320	188,959	518
1940	51,496	141	78,970	216	130,466	356
1941	33,238	91	75,592	207	108,830	298
1942	33,834	93	83,073	228	116,907	320
1943	41,342	113	108,615	298	149,957	411
1944	34,238	93	173,378	474	207,616	567
1945	32,998	90	149,985	411	182,983	501
1946	42,436	116	110,687	303	153,123	419
1947	46,355	127	118,122	324	164,477	451
1948	39,736	108	94,938	259	134,674	367
1949	33,069	91	86,307	236	119,376	327
1950	34,823	95	76,483	210	111,306	305
1951	28,604	78	125,448	344	154,052	422
1952	26,727	73	132,992	363	159,719	436
1953	19,921	54	125,580	344	145,501	398
1954 Est.	12,000	33	101,000	277	113,000	310

U. S. Imports of Crude Oil and Refined Products, by Years

(Source: Bureau of Mines, except Nov.-Dec., 1953, from API)

THOUSANDS OF BARRELS

YEAR	CRUDE Total	CRUDE Daily	REFINED Total	REFINED Daily	ALL OILS Total	ALL OILS Daily
1918	37,736	103	1,227	3	38,963	106
1919	52,822	145	1,376	4	54,198	148
1920	106,175	290	2,647	7	108,822	297
1921	125,364	343	3,428	9	128,792	353
1922	130,255	357	5,719	16	135,974	373
1923	82,015	225	17,638	48	99,653	273
1924	77,775	212	16,806	46	94,581	258
1925	61,824	169	16,376	45	78,200	214
1926	60,382	165	20,938	57	81,320	223
1927	58,383	160	13,353	37	71,736	197
1928	79,767	218	11,790	32	91,557	250
1929	78,933	216	29,777	82	108,710	298
1930	62,129	170	43,489	119	105,618	289
1931	47,250	129	38,837	106	86,087	236
1932	44,682	122	29,812	81	74,494	203
1933	31,893	87	13,501	37	45,394	124
1934	35,558	97	14,936	41	50,494	138
1935	32,239	88	20,396	56	52,635	144
1936	32,327	88	24,777	68	57,104	156
1937	27,484	75	29,673	81	57,157	157
1938	26,412	72	27,896	76	54,308	149
1939	33,095	91	25,965	71	59,060	162
1940	42,662	117	41,089	112	83,751	229
1941	50,606	139	46,536	127	97,142	266
1942	12,297	34	23,669	65	35,966	99
1943	13,833	38	49,579	136	63,412	174
1944	44,805	122	47,506	130	92,311	252
1945	74,337	204	39,282	108	113,619	311
1946	86,066	236	51,610	141	137,676	377
1947	97,532	267	61,857	169	159,389	437
1948	129,093	353	59,051	161	188,144	514
1949	153,686	421	81,873	224	235,559	645
1950	177,714	487	132,547	363	310,261	850
1951	179,073	491	129,121	354	308,194	844
1952	209,591	573	138,916	379	348,507	952
1953	235,088	644	143,724	394	378,812	1,038
1954 Est.	250,000	685	150,000	411	400,000	1,096

East Coast and a 29 cents a barrel advantage over Venezuelan crude.

In 1952, when higher tanker rates were in effect and crude oil postings were 25 cents a barrel lower in the three areas, Persian Gulf crude was $1.05 a barrel higher delivered to the U. S. East Coast than West Texas crude. Venezuelan crude in 1952 was 4 cents per barrel cheaper than West Texas crude, compared with 1953 when Venezuelan crude had only a 1 cent a barrel price advantage over U. S. West Texas.

Over-all effect has been that since 1952 delivered prices of Persian Gulf crude has declined $1.44 per barrel, while Venezuelan crude prices have dropped 6 cents a barrel, and West Texas crude has decreased by 9 cents a barrel.

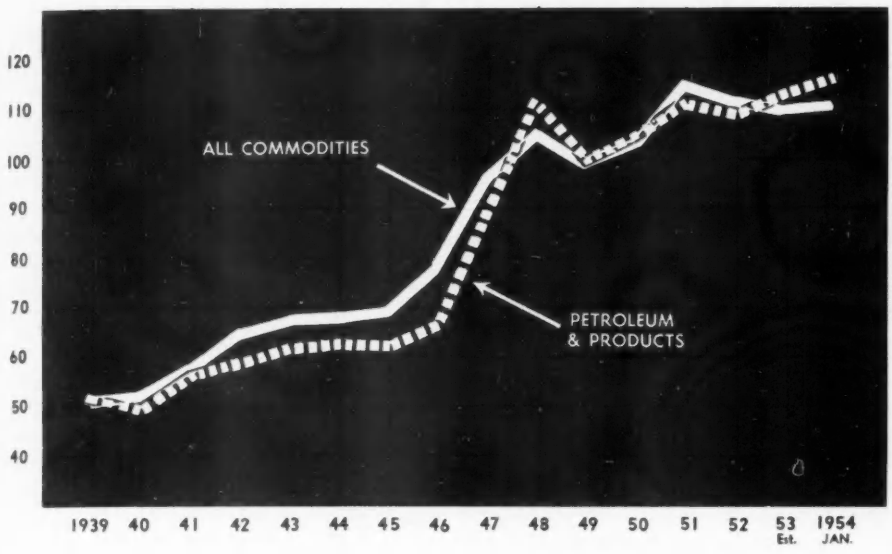
Barring any sharp increases in Middle East royalties, production costs of Persian Gulf crude will continue to be lower than for U. S. or Venezuelan producers, and the Middle East produced crude can be expected to have a decided price advantage as long as current tanker rates continue. Various forecasts of tank ship availability over the next four years indicate an expanding surplus annually of available ships over the peak winter requirements, indicating continued pressure on world tanker rates.

The world petroleum tanker fleet at the end of 1953 amounted to 21,964,000 gross tons, according to Lloyd's Register of Shipping, and represented 24 percent of the aggregate of all steam and motor vessels. In 1952 tankers made up 22 percent of the world fleet, and in 1939 they amounted to 17 percent of the total.

There are other incentives that point to continued high U.S. imports. The policies of the Eisenhower Administration have urged increased imports to the U. S. and specifically the recommendations of the President's Foreign Economic Policy (Randall) Commission propose a step-by-step lowering of U. S. tariff barriers and liberalizing trade policies. Also, administration leaders in Congress have proposed that special income tax credits be given U. S. firms operating abroad, as an incentive for further investment of U. S. dollars in foreign areas by private business.

INDEX OF WHOLESALE PRICES

1947—1949 = 100



Index of Wholesale Prices

(All Commodities vs. Crude Petroleum and Petroleum Products.)

Source: U. S. Bureau of Labor Statistics. 1947-1949 = 100

YEAR	All Commodities	Crude Oil & Products	YEAR	All Commodities	Crude Oil & Products
			1946	78.7	66.3
			1947	96.4	88.2
1939	50.1	51.3	1948	104.4	111.7
1940	51.1	49.1	1949	99.2	100.1
			1950	103.1	103.7
1941	56.8	56.0	1951	114.8	110.5
1942	64.2	58.7	1952	111.6	109.3
1943	67.0	61.4	1953 Est.	110.0	112.9
1944	67.6	62.7	1954 Jan.	110.8	116.3
1945	68.8	62.4			

Petroleum Prices . . . Show some unsteadiness as supplies threaten to exceed demand.

PRICES OF PETROLEUM and petroleum products showed some unsteadiness in the closing months of 1953 and early 1954, and it is uncertain what their trend will be this year.

It appears at present that the two separate waves of inflation following the end of World War II and at the beginning of the Korean War, respectively, have about spent themselves. Prices in general, including petroleum prices, have been for two years leveling off on the high plateau they reached in late 1951. For commodities in general, prices have slipped a little from 1951, but lately have shown some recovery. For petroleum and petroleum products in the aggregate, prices in the latter half of 1953 reached their highest point since the end of World War II, following the crude price increases of mid-1953, averaging about 25 cents a barrel.

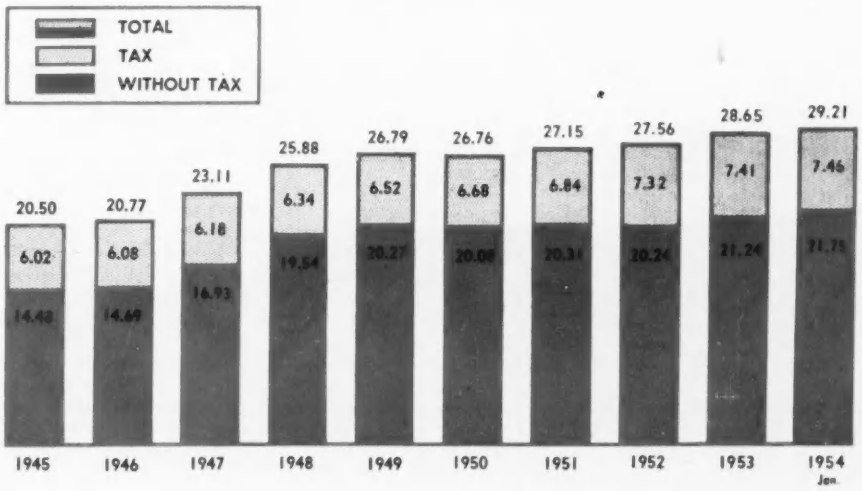
After that crude raise, prices of petroleum products were increased proportionately, to compensate refiners for the higher cost of their raw material. But in recent months the prices of the products slipped appreciably, especially motor fuel prices, including prices of natural gasoline. Putting pressure on gasoline prices were the relatively large increases in stocks of that product, beginning early in the fall and continuing to now. U. S. stocks of refined products showed a net increase of approximately 51 million barrels in 1953. For 1954 no large net increase in stocks of crude or products is considered essential, and if such an increase should occur, it undoubtedly would tend to depress prices.

Costs Conform. Prices of petroleum and petroleum products very closely conform with the trend of the prices of all commodities in the aggregate, as shown on a chart and in a table herewith. At times the index of petroleum prices has been a little under the index for all commodities, at times nearly the same, and sometimes a little above it. In 1951 and 1952, petroleum prices were frozen at levels that were low in relation to other prices. In 1953 oil prices were increased and went a little higher relatively than prices of other commodities, with the latter showing some decline. As 1954 began, petroleum prices were about 16 percent above their average level of 1947-1949, while wholesale prices of all commodities are about 11 percent above the 1947-1949 average.

As stated before, the index for pe-

UNITED STATES GASOLINE PRICES

(CENTS PER GALLON)



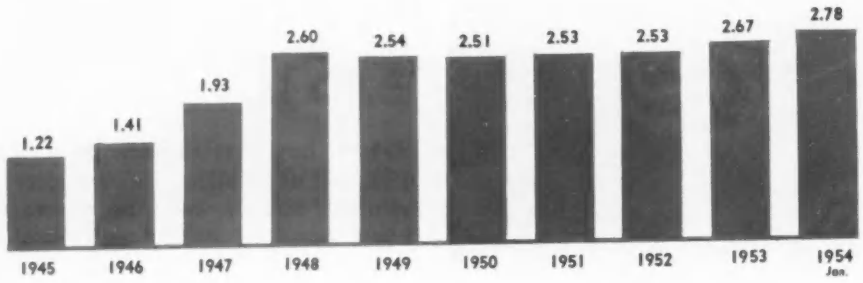
troleum has stuck very close to that for all commodities since World War II, and while the two curves have diverged some during the past half year, they are even now heading toward each other, oil prices sagging some and other commodities improving some. Of course, the trend for all commodities is the predominant curve, and its future course will largely determine that of petroleum prices. If commodities in general continue steady around present levels, then petroleum prices should do likewise, provided the industry keeps supplies reasonably in balance with demand.

Crude prices in the U. S. now average about $2.78 per barrel, the highest since 1920, when they averaged $3.07. With exception of the 1920 price, the present price is the highest for over 80 years, or since 1872.

In 1951 and 1952 crude prices were frozen because of the Korean War and averaged about $2.53 per barrel. Early in the Eisenhower administration, prices were de-controlled, and promptly, on February 16, 1953, crude prices were increased in Pennsylvania and in California. In the Mid-Continent, crude prices remained unchanged for four months and then on June 15, 1953, were raised about 25 cents a barrel. Oklahoma-Kansas 36-36.9 gravity crude, a typical oil, was raised from $2.57 to $2.82 per barrel. Because of these increases, the average price of crude in the U. S. in 1953 was about $2.67 per barrel, compared with $2.53 in 1952 and the present average price of about $2.78.

UNITED STATES CRUDE OIL PRICES

(DOLLARS PER BARREL)



Crude Price Changes in Mid-Continent, California, and West Texas, by Years

(Dollars Per Barrel)

DATE	Okla.. Kans. 36-36.9° Gravity	Calif.. Long Beach 27-27.9°	West Texas Sour 30-30.9°
1937: Prior to Jan. 1	$1.10	$1.10	$0.78
January 28	1.22	....	0.88
1938: October 12	1.02	....	0.75
1939: No Changes	....	....	....
1940: February 1	....	1.03	....
1941: March 29	....	....	0.82
April 1	1.07	....	....
April 24	....	1.09	....
May 20	1.17	....	....
May 21	....	....	0.92
May 23	....	1.15	....
1942: Feb. 3; frozen at Oct. 1, 1941 level	1.17	1.15	0.92
1943; 1944; 1945: No Changes; prices frozen	....	....	....
1946: April 1; OPA Raise	1.27	1.25	1.02
July 25 Oil Prices decontrolled	1.52	....	1.27
August 1	....	1.50	....
November 15	1.62	....	....
November 19	....	....	1.37
1947: March 10	1.87	....	1.62
March 19	....	1.75	....
July 1	....	1.95	....
October 15	2.07	....	....
October 16	....	....	1.82
December 6	2.57	....	2.32
December 27	....	2.45	....
1948: No Change	....	....	....
1949: June 1	....	2.37	....
1950: December 12	....	2.41	....
1951: Frozen at Jan. 25 level	2.57	2.41	2.32
1952: No Changes; frozen	....	....	....
1953: Feb. 16 decontrolled	....	2.76	....
June 15	2.82	....	....

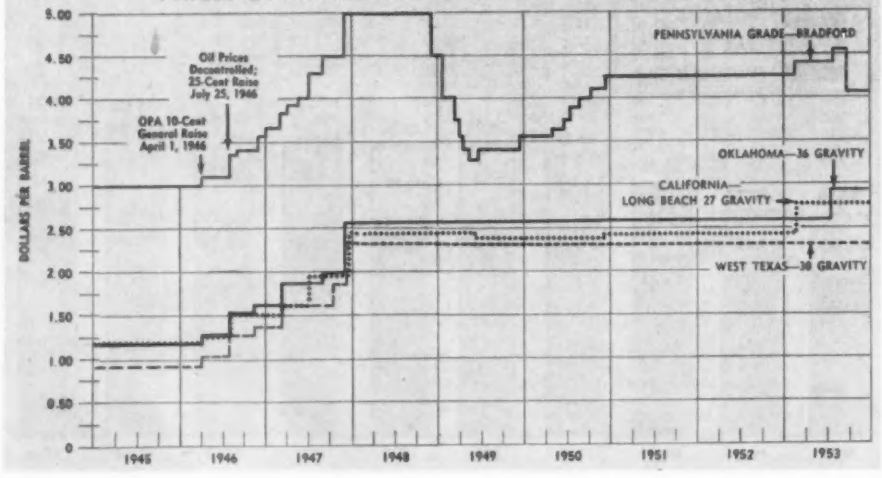
Changes in Prices of Bradford, Pennsylvania, Crude, by Years

(Dollars Per Barrel)

Date	Price	Date	Price	Date	Price
1937: Before Jan. 1	$2.15	1941: Jan. 27	$2.30	1948: Dec. 11	$4.50
Feb. 24	2.67	April 23	2.40	1949: Jan. 21	4.00
June 7	2.82	May 20	2.55	Mar. 11	3.75
Sept. 1	2.60	June 18	2.75	April 1	3.55
Oct. 12	2.35	Aug. 14	2.98	April 13	3.40
Dec. 1	2.20	Aug. 23	2.75	May 11	3.27
1938: Mar. 7	2.05	1942: [1]Feb. 3	2.75	June 16	3.40
June 13	1.80	[2]Mar. 26	3.00	Dec. 12	3.54
Sept. 1	1.68	[3]1943:		1950: May 1	3.65
1939: Jan. 21	1.80	[3]1944:		June 21	3.75
Feb. 1	1.88	[3]1945:		July 19	3.89
Mar. 6	2.00	1946:		Aug. 25	4.00
Oct. 6	2.25	[4]April 1	3.10	Oct. 9	4.10
Nov. 1	2.40	[5]Aug. 1	3.35	Dec. 9	4.25
Dec. 1	2.50	Sept. 1	3.41	[6]1951:	
1940: Jan 1	2.75	Dec. 9	3.55	[6]1952:	
May 22	2.50	1947: Jan. 1	3.65	1953: Feb. 16	4.40
June 18	2.25	Mar. 1	3.81	Aug. 1	4.55
July 12	2.00	April 1	3.91	Sept. 21	4.05
Aug. 18	1.85	May 16	4.05		
Nov. 12	2.00	July 1	4.30		
Dec. 17	2.15	Sept. 1	4.50		
		Dec. 1	5.00		

[1] Frozen at Oct. 1, 1941 level. granted. [3] No change; price frozen. OPA. [5] Oil prices decontrolled July 25, 1946. [6] No change; price frozen at Jan. 25, 1951, level. [2] Penn. grade raise [4] Raise granted by

PRICES OF PRINCIPAL U. S. GRADES OF CRUDE OIL



U. S. Average Prices of Crude Oil at Wells and Gasoline in 50 Cities, by Years

Sources: Crude prices from Bureau of Mines except 1953 and Jan., 1954, estimated; gasoline prices from The Texas Company via API.

YEAR	Crude Oil ($ per Bbl)	Gasoline (¢ per Gallon) Excl. Tax	Tax	Incl. Tax
1918	1.98	25.12	0.00	25.12
1919	2.01	25.41	0.06	25.47
1920	3.07	29.74	0.09	29.83
1921	1.73	26.11	0.20	26.31
1922	1.61	24.82	0.38	25.20
1923	1.34	21.06	0.91	21.97
1924	1.43	19.46	1.48	20.94
1925	1.68	20.09	2.11	22.20
1926	1.88	20.97	2.41	23.38
1927	1.30	18.29	2.80	21.09
1928	1.17	17.90	3.04	20.94
1929	1.27	17.92	3.50	21.42
1930	1.19	16.17	3.78	19.95
1931	.65	12.98	4.00	16.98
1932	.87	13.30	4.63	17.93
1933	.67	12.41	5.41	17.82
1934	1.00	13.64	5.21	18.85
1935	.97	13.55	5.29	18.84
1936	1.09	14.10	5.35	19.45
1937	1.18	14.59	5.40	19.99
1938	1.13	14.07	5.44	19.51
1939	1.02	13.31	5.44	18.75
1940	1.02	12.75	5.66	18.41
1941	1.14	13.30	5.93	19.23
1942	1.19	14.46	5.97	20.43
1943	1.20	14.56	5.97	20.53
1944	1.21	14.62	5.97	20.59
1945	1.22	14.48	6.02	20.50
1946	1.41	14.69	6.08	20.77
1947	1.93	16.93	6.18	23.11
1948	2.60	19.54	6.34	25.88
1949	2.54	20.27	6.52	26.79
1950	2.51	20.08	6.68	26.76
1951	2.53	20.31	6.84	27.15
1952	2.53	20.24	7.32	27.56
1953 Est.	2.67	21.24	7.41	28.65
1954 Jan.	2.78	21.75	7.46	29.21

ROLLER KELLY
DRIVE BUSHING
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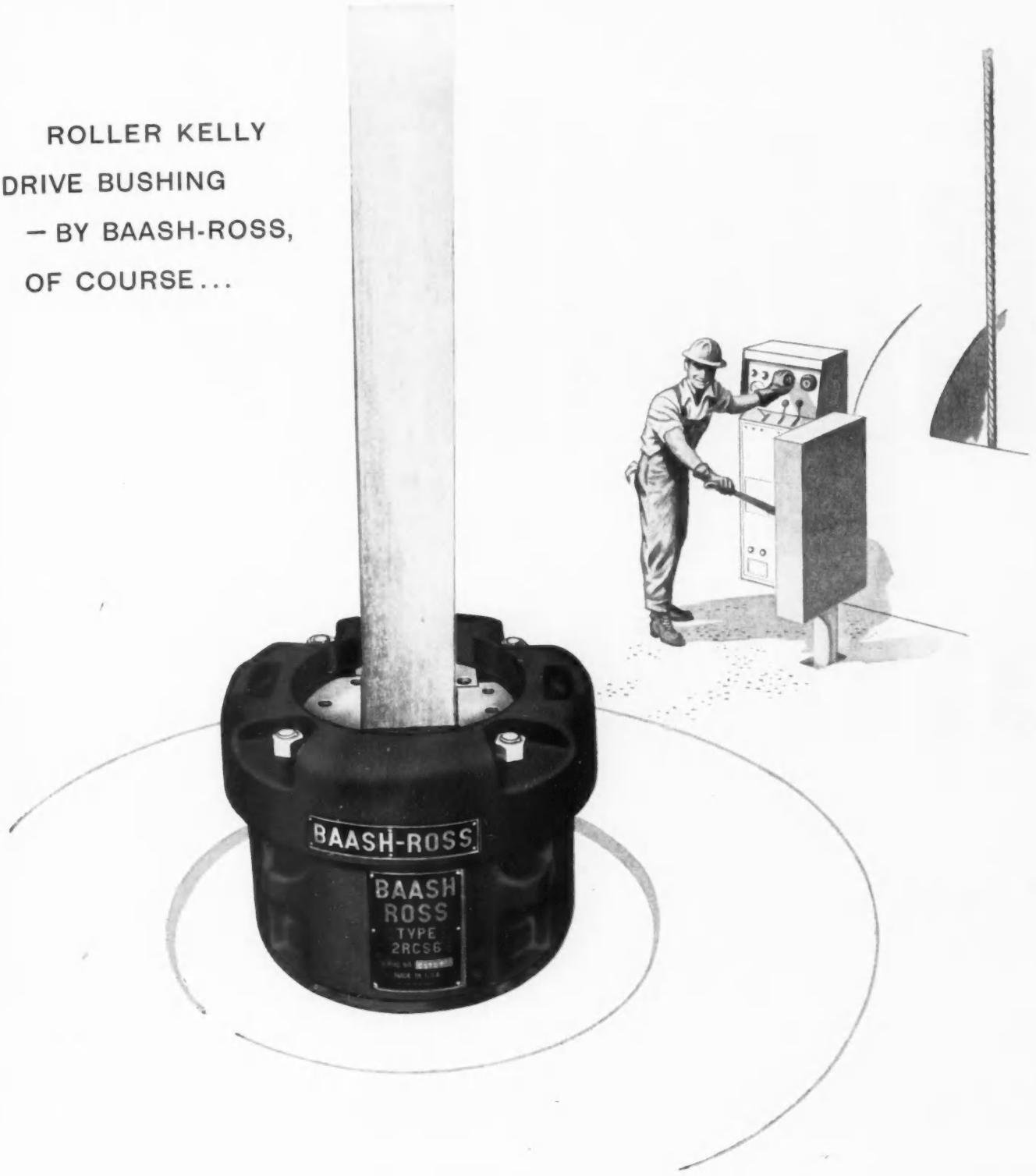
OF COURSE...



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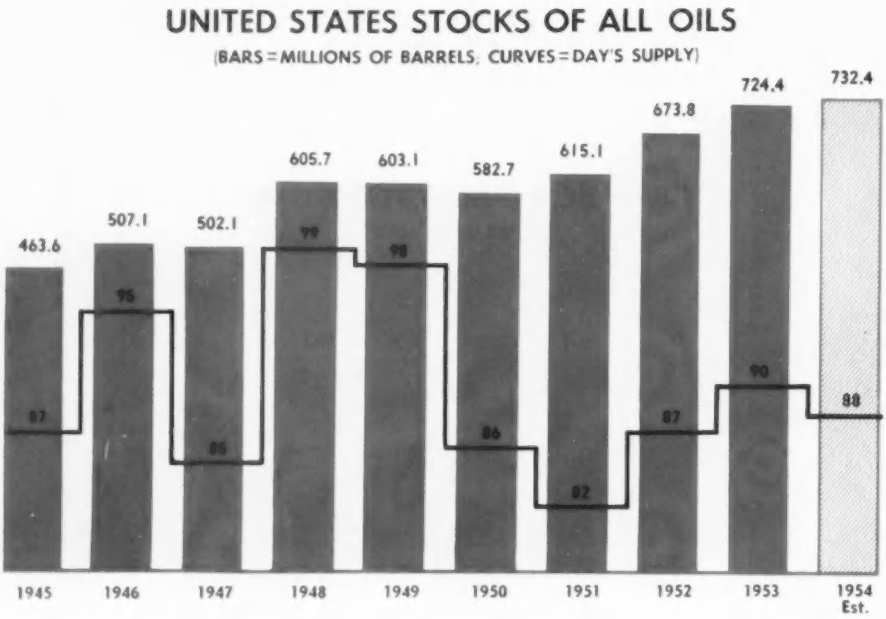
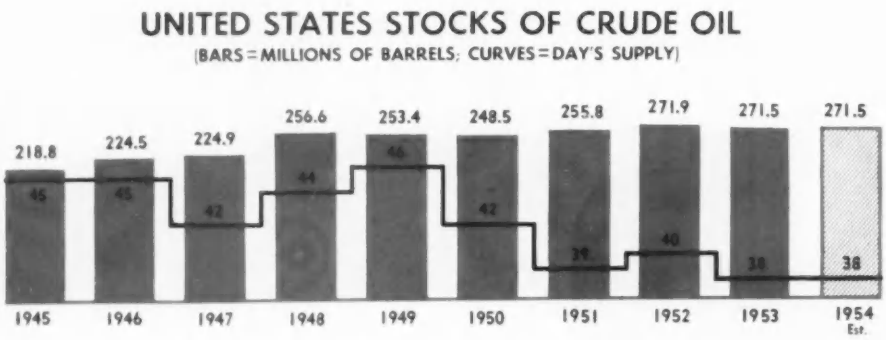




Stocks of Oils . . . Industry must be on guard after heavy stockpiling during 1953.

IN 1954 THE U. S. oil industry will need to keep close watch on stocks of crude oil and refined products, lest they become excessive, following heavy stockpiling of gasoline and distillate fuel oil in 1953.

Demand and supply outlook for 1954 calls for no net increase during the year in stocks of crude oil and only a relatively small net increase in stocks of refined products. In its forecast for 1954, the U. S. Bureau of Mines indicated that the industry should not find it necessary to make any net change during the year in crude stocks, and that there might reasonably be a net increase of only 8 million barrels, or 22,000 barrels daily, in stocks of refined products.

These implications were made along with estimates that in supplying the prospective demand for oils in 1954, there would be increases of 6.3 percent in crude imports, 4.4 percent in product imports, 6.7 percent in natural gasoline output, 2.2 percent in crude runs to stills, and 1.5 percent in domestic crude production.

If the industry should step up imports, domestic production, and runs to stills more sharply than those percentages, the result would be surplus supplies of crude and products and unnecessary increases in stocks.

Crude stocks showed practically no net change in 1953 and the 271,554,000 barrels held at year's end represented 38.2 days' supply, based on demand for crude in 1953. The same amount of stocks at end of 1954 would equal 37.5 days' supply at the predicted rate of demand in 1954.

Refined products stocks at end of 1953 aggregated 440,544,000 barrels, an increase of 46,525,000 barrels or 11.8 percent over the end of 1952. Motor fuel stocks of 162,670,000 barrels at end of 1953 were up 27,071,000 barrels or 20 percent and equalled 46.9 days' supply against 41.6 days' a year earlier.

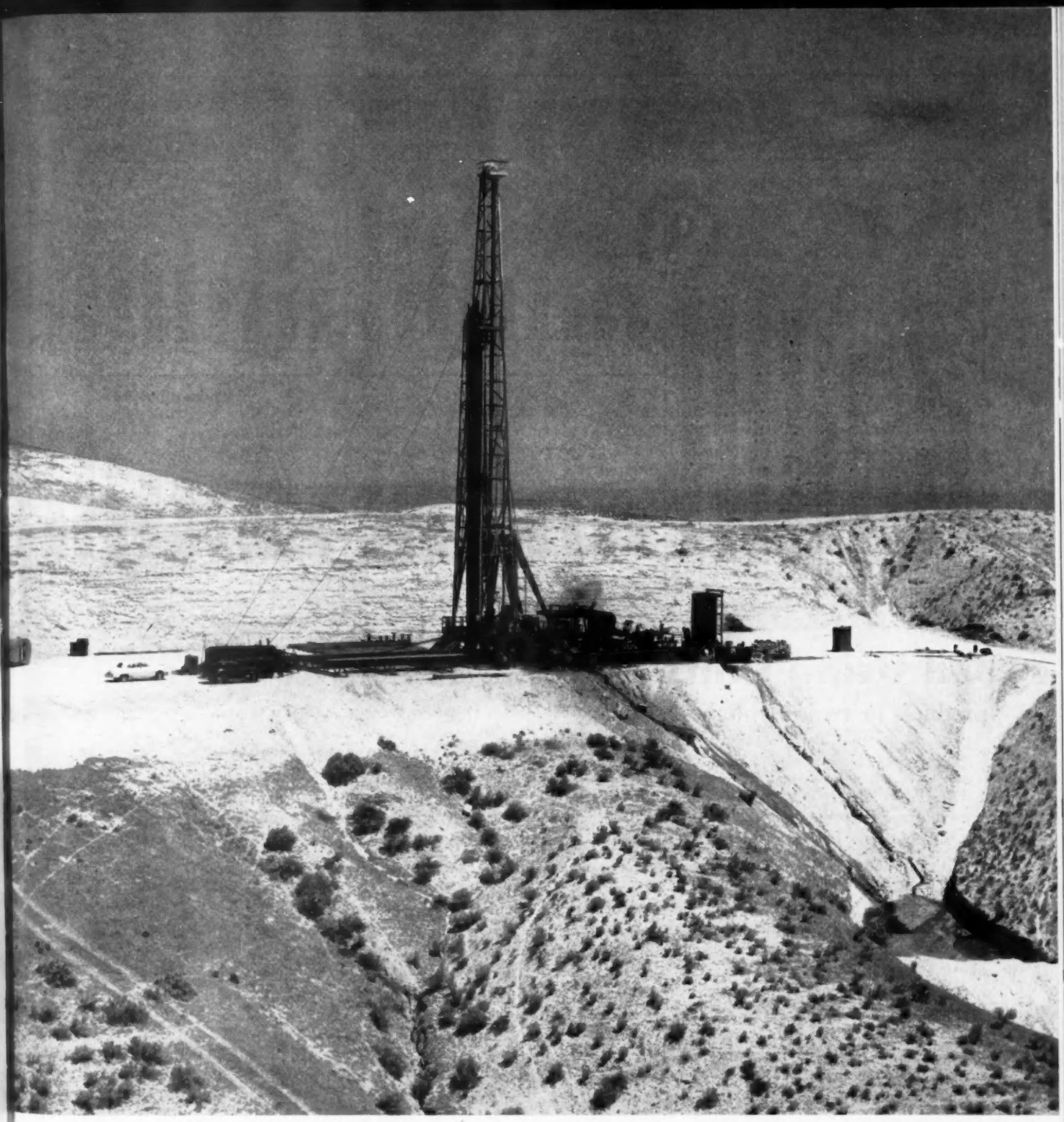
Distillate fuel oil stocks at end of 1953 totaled 115,666,000 barrels, up 16,084,000 barrels or 16.1 percent, and equaled 80.8 days' supply compared with 7.1.

Kerosine stocks of 29,415,000 barrels were up 2,573,000 barrels or 9.6 percent and equaled 84.5 days' supply against 74.1. Residual fuel oil stocks of 49,542,000 barrels or 30.8 days' supply were nearly the same as a year earlier, in barrels or days' supply.

U. S. Stocks of All Oils and Crude Oil
(Source: Bureau of Mines, except Nov.-Dec., 1953, estimated.)
THOUSANDS OF BARRELS

END OF YEAR	ALL OILS		CRUDE OIL	
	Barrels	Days' Supply	Barrels	Days' Supply
			Refinable	
1918	193,411	165	144,336	125
1919	200,383	164	149,356	127
1920	209,845	156	149,448	103
1921	294,428	203	217,324	150
1922	385,349	232	295,708	181
1923	492,088	235	340,637	169
1924	520,287	236	360,475	171
1925	552,464	239	345,863	150
1926	527,084	210	315,029	133
1927	597,176	231	379,660	155
1928	621,010	224	392,629	148
1929	689,166	228	428,445	149
1930	665,497	224	411,882	153
1931	621,673	221	370,194	144
1932	590,106	230	339,875	145
1933	602,198	226	354,223	140
1934	564,350	199	337,254	128
1935	541,700	178	314,855	109
1936	519,229	155	288,579	91
1937	564,728	154	305,833	87
1938	567,703	156	274,165	79
1939	525,838	135	238,910	66
1940	563,277	141	264,079	70
1941	552,328	127	247,499	61
1942	497,940	116	234,889	61
1943	485,698	106	243,506	59
1944	477,089	95	220,862	46
1945	463,579	87	218,763	45
1946	507,094	95	224,473	45
1947	502,053	85	224,929	42
1948	607,856	99	246,572	43
			All Crude	
*1948	605,743	99	256,627	44
1949	603,119	98	253,356	46
1950	582,710	86	248,463	42
1951	634,109	85	255,783	39
1952	673,754	87	271,928	40
1953	724,367	90	271,554	38
1954 Est.	732,367	88	271,554	38

* Revised; new basis.



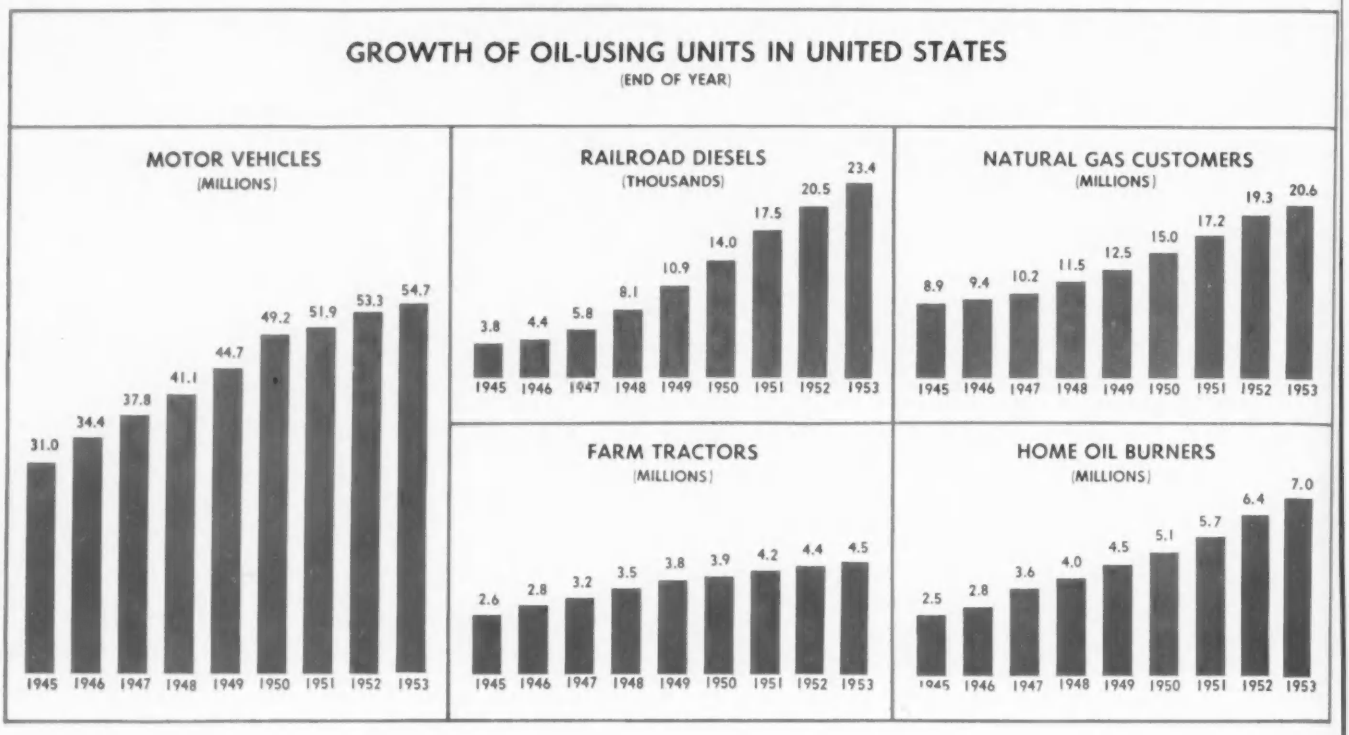
Wire Rope at Work—Standing like a lone sentinel in the desert near Taft, California, this jackknife rig was drilling through sand and shale at 4500 ft when the picture was taken. The final depth was 7000 ft; there the contractor, Clyde Hall Drilling Co., struck a pool flowing 1500 bbl of 34 gravity crude per day. The well is the property of Pacific Western Oil Corporation.

Throughout this job the contractor rigged his outfit with Bethlehem wire rope, 1⅛-in. Purple Strand being used for the rotary line and a 9/16-in. rope for the sand line. Here, as expected, the Bethlehem rope did a thoroughly reliable job, easily handling the long strings of drill pipe and other heavy loads.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

PETROLEUM • MINING • CONSTRUCTION • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING



Oil Using Units . . . Continue to increase in U. S., calling for petroleum products in greater volumes.

OIL-USING UNITS continue the growth begun at the end of World War II, but with abated acceleration.

The upward trend continues throughout the five major groups—motor vehicles, railroad diesels, farm tractors, natural gas consumers and home oil burners—but with nothing like the spectacular surge recorded at war's end, and at not quite the rate of previous years.

The plateau has been reached. Sharp new demands anywhere down the line are as unlikely as sudden declines.

Exactly following the growth pattern of recent years, railroad diesels again recorded the greatest percentage increase in 1953, though the rate of gain was less vigorous.

Railroad diesels' increase last year was 14.1 percent over the year before, which compares with a 17.1 percent increase for 1952, and a 25 percent increase in 1951—the greatest gain made by any of the major groups.

The number of these units in use was 23,400 in 1953, a total assured of a steady rise as the railroads put into effect their announced programs of dieselization.

Great Gains. The 1953 figure assumes spectacular proportions when submitted to a comparison with early postwar totals. In 1945 there were only 3800 railroad diesels in use, and the number did not reach 10,000 until 1949.

The second greatest percentage gain made by any of the major groups was recorded by home oil burners. Unlike the others, this group had continued to increase its percentage gain into 1952. But last year it joined the trend, and the result was a lower increase. There were 9.4 percent more home oil burners in use in 1953, compared with a 12.3 percent gain registered in 1952 and an 11.8 percent increase in 1951.

The total in use is now 7 million, or almost three times the total for 1945. This tremendous growth has continued smoothly and without a setback in any year despite fluctuations in home building, government control of supplies, unusual weather, a crippling steel strike, and other punishing factors.

Also still on the upward trend, but rising less harply than home oil burners is the growth of natural gas customers, which totaled 20,600,000 as the new year began.

The markets opened to natural gas in the years since World War II assure it of a steady growth for many years.

Slow Climb. Terrific postwar demand pushed the number of motor vehicles in use from 31 million in 1945 to 49,200,000 in 1950. Thereafter the climb has been painfully slow as the industry moved deeper into a buyers' market. This status became more pronounced statistically in 1952, when the rate of gain slumped from 5.5 percent to 2.7 percent. Last year the trend followed the previous year's pattern, flattening to a 2.6 percent gain. This year, with a cutback in production indicated, the growth rate may slump another notch, adding fewer units to the 54,700,000 in use during 1953.

Greatest slump in growth rate among the major groups was in farm tractors, of which 4½ million were in use in 1953.

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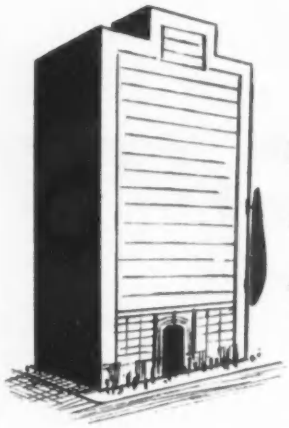
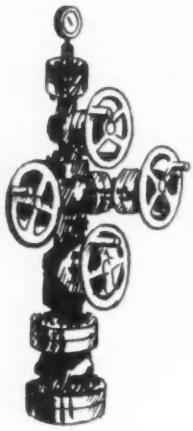


Lower maximum capital gains tax scheduled



Individual tax rates decrease by 10 percent

How Tax Changes Affect Your Industry

Widespread adjustments are required. New rules will concern every individual and every company. Here is a quick rundown on major innovations, made and proposed.

By D. E. SNYDER, CPA and Attorney, Arthur Young & Company, Tulsa

NEW AND PROPOSED federal tax changes will have far-reaching effects on the oil industry in 1954.

On Dec. 31, 1953, the excess profits tax law expired. On Jan. 1, 1954, individual tax rates decreased by an average of about 10 percent. The maximum tax on capital gains is to be 1 percent lower in 1954. Further, an automatic reduction in corporate tax rates may be effective after March 31, 1954, so that corporate rates for 1954 will average out at about 48¼ percent as compared with the 1953 average rate of 52 percent.

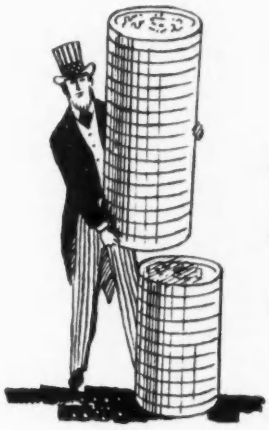
Other significant proposals scheduled for consideration during 1954 include a more liberal depreciation policy; amendment of Section 102 surtax on corporations for improper accumulation of surplus; the reduction or removal of the additional 2 percent surtax if consolidated returns are filed; some relief concerning the taxation of income derived from foreign investments; and possibly a more liberal rule for treatment of geological and geophysical costs. Also, by court decisions there may be a change in the treatment of taxing profits derived from the sale of "carved out" oil payments.

Changes Explained. The expiration of the excess profits tax and the rate changes need no further explanation. The proposal for a more liberal depreciation policy contemplates in general that the Internal Revenue will publish maximum and minimum rates of depreciation and taxpayers will have an election as to the rate desired. Once elected, the rate must stand. Such a policy would permit the recovery of capital expenditures over a period of, say, five years if so elected instead of an ordinary estimated life of say 20 years.

In general it can be said that Section 102 surtax has the effect of a penalty. It is imposed upon successful corporations which fail to pay substantial annual dividends. Such a tax is asserted if it is thought that a corporation is formed or availed of for the purpose of avoiding individual surtax on its stockholders. Some economists have labeled the 102 surtax as a penalty for saving. The administration of this tax law by the Internal Revenue service has received some unfavorable criticism and as a result there have been proposals to amend the law so as to permit corporations to accumulate a larger amount of profits.

Also, it has been proposed that the law be amended to require that the Internal Revenue service assume the

New view asked on geophysical, geological costs



Excess Profits tax thrown out on December 31

What is the outlook for the President's tax program in Congress? For the answer to this and a complete round-up of the political picture, see page 82.

Relief sought on investments outside U. S.

burden of providing that any corporation was organized or availed of for the purpose of avoiding individual surtax instead of the present requirement that calls taxpayers to assume the burden of proving that the corporation was not organized or availed of for that purpose.

If a parent corporation elects to file a consolidated return, that is, include its income or loss with that of all its subsidiaries in one return, then such consolidated income will be assessed an additional 2 percent surtax. It has been proposed that such 2 percent surtax is unfair and should be eliminated. If it were so eliminated more parent oil corporations would file consolidated returns than is being done at the present time, and thus receive a tax benefit from the development losses incurred by subsidiaries.

Foreign Investments. Many oil corporations have large investments in foreign countries. They would probably increase the amount of such investments if some relief from foreign taxes on such investments could be expected. It has been argued that foreign tax rates and foreign administration of tax laws are too unsettled for sound management to increase the amount of such investments. It is understood that studies are presently being made of this problem and as a result some tax relief for the foreign investor may result in the form of treaties.

A commercial corporation presently pays income taxes on its entire net profits. Thereafter when such remaining profits are distributed to individual stockholders as dividends, the profits are again taxed. Thus, in effect, the corporate profits are taxed twice. Some relief from this double taxation is expected during 1954 by allowing a 10 percent tax exemption for all dividends received by an individual stockholder.

During the past few years there has been considerable confusion regarding the proper treatment of geological and geophysical costs, i.e., what amount should be expensed for tax purposes and what amount constitutes capital investment. It has been proposed that the Internal Revenue Service publish a more liberal ruling allowing the deduction of a larger portion of such costs at the time they are incurred.

Some years ago the Revenue Service took the position that profits from the sale of "carved out" oil payments constituted ordinary income instead of capital gain. Since that time there has been much discussion of this matter, and it was decided by some taxpayers to test the legality of the ruling in the courts. The issue is now pending with various courts and some of these will be decided during 1954. If the ruling is ultimately overthrown by the courts, there will be a considerable change in the tax planning of many taxpayers. A tremendous increase in the number

of oil payment sales would result in order to receive the benefit of capital gain treatment on the profits therefrom.

Tax Dollars. So-called tax dollars may be defined as representing investments for development and drilling of minerals which costs, if so elected, are permitted as deductions in computing taxable net income. Examples of such expenditures are wages, fuel, repairs, hauling and supplies incurred for preparation of drilling; the construction of derricks, tanks and pipe lines incident to drilling; and the actual drilling and testing of wells. If a corporation pays an average of 50 percent of its profits for income taxes, then if deductible development costs are incurred during the year of, say, $6 million, the taxable profits will be decreased by the same amount, and, of course, income taxes will be decreased by $3 million (50 percent of $6 million). Thus, in effect, because of the $3 million tax saving the net cost to the corporation of the development costs is only $3 million. The net cost would still be less if the corporation had paid excess profits tax.

It is recognized generally that oil companies conducted major development programs during the past three high tax rate years. Also, many companies and individuals not primarily engaged in the oil business during this same period invested so-called tax dollars in developing oil properties. Thus, it can be predicted, assuming all other economic factors remained the same, that the expiration of excess profits tax and other rate decreases as well as a more liberal administration of Section 102 surtax will result in some withdrawal of the so-called tax dollar investment. Whether this will cause a decrease in development will, of course, depend on other factors.

Proposed tax changes that might offset a development decline are a more liberal treatment of geological and geophysical costs, some relief on taxation of foreign investments, the removal of the 2 percent tax on consolidated returns, and a change in the taxing of profits from the sale of "carved out" oil payments.

General Effects. There is no doubt that the tax rate decreases and other 1954 proposed tax changes will permit taxpayers to retain a larger percentage of the total profits. As previously explained, many oil companies have during the past three years engaged in an accelerated development program, thus causing a decrease in their working capital. Such companies are desirous of increasing the working capital ratio with production. Moreover, if companies are allowed to retain a larger percentage of profits, more dividends could be paid so that individual stockholders may take advantage of the proposed 10 percent dividends credit. From the foregoing, it would seem that in 1954 production would not decrease substantially. Again, however, it is emphasized that income tax is only one economic factor affecting production.

Capital Expenditures. The investment of so-called tax dollars during the past few years by oil companies has required considerable funds. Consequently, little or no funds were available for non-deductible major capital expenditures. In order to interest companies to incur capital investment during the past three years, Congress enacted the special amortization laws applicable to emergency facilities. In general the laws provided that capital expenditures for certain emergency facilities could be recovered over a period of five years instead of normal depreciation periods. These amortization benefits resulted in the construction and enlargement of refineries, gas plants and pipe lines, etc.

The peak of the emergency construction period has passed and in all probability the government will not certify nearly as many facilities during 1954 as were certified in past years; and without certification it would seem that many oil companies will defer major capital expenditures because such expenditures will militate against increasing their working capital ratio. Accordingly, the proposed change in the law to permit a somewhat accelerative depreciation rate will certainly be needed to encourage continued capital construction during 1954. Congress recognizes the problem exists as evidenced by the special provision enacted in 1953 permitting a special five-year amortization period for grain storage elevators. It is anticipated that similar provisions will be extended to cover other industries. The extent of the relief, however, is difficult to predict and it may come too late to be of any aid in 1954.

Exploration Drilling. The expected decrease during 1954 of investing the so-called tax dollar would have a retarding influence on wildcatting operations. However, the ability to retain more of the profit would encourage such activities. Therefore, exploratory activity may not decrease. This would be especially true if the Revenue Service published a 1954 ruling permitting a more liberal policy for deducting geological and geophysical costs. Such a ruling would probably result in oil companies continuing their intensive search for new reserves.

Some proposed 1954 tax changes which could alleviate a decrease in drilling are the decreased tax rates causing the drilling of proven reserves to increase production and company profits, and the holding by the courts that sales of "carved-out" oil payments constitute capital gain. Thus more oil payments would be sold to secure funds for further drilling.

All of the 1954 tax changes and proposed changes referred to here will be of some benefit to the oil industry as well as other businesses. Furthermore, if some of the proposals ultimately become law a smaller percentage of 1954 profits will be paid for income taxes, thus creating a profit incentive which will tend to offset some of the decrease.—**The End**

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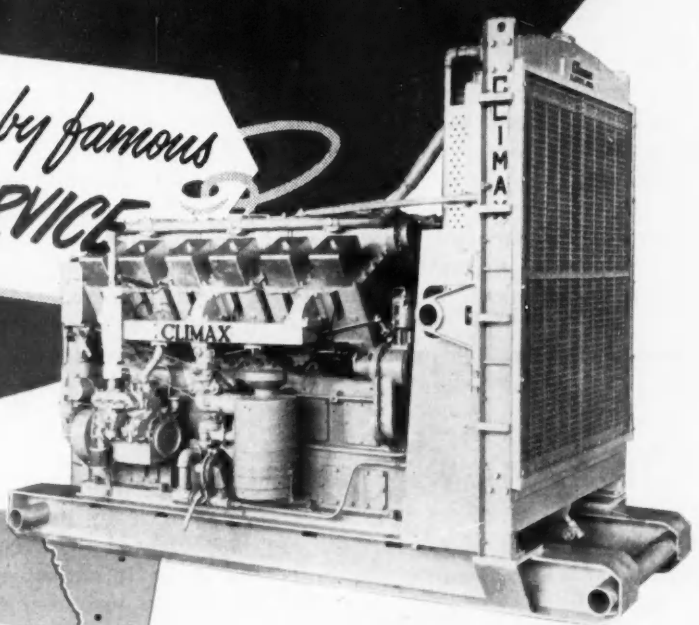

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Legislative Outlook . . . The emphasis shifts to domestic issues.

Election year lull makes true appraisal more difficult.

By L. DAN JONES, Assistant General Counsel,
Independent Petroleum Association of America

THE CURRENT SESSION of Congress inevitably will be a significant one to every citizen and segment of American business, including the petroleum industry. The relative calm now being enjoyed on the international scene has brought about a shift to a greater emphasis on domestic issues. This brings the outlook closer at hand somewhat more easily determinable. At the same time, this being an election year, there will be a strong sentiment in Congress to defer as many controversial issues as possible, to conclude the essentials, and go home —thus making it more difficult to appraise the extent of the legislative program that might be concluded before adjournment.

Year of study. The past year to a large extent has been one of study and familiarization on the part of the new administration. It apparently is ready now to move forward. This readiness for an active program has already been evidenced in the President's messages to Congress. The proposals on such far-reaching subjects as taxes and the budget and on such widespread segments of our economy and activity as agriculture, labor, and social security, if effectuated, inescapably will profoundly affect every facet of the national life. The substantial reorientation of the military program and other aspects of the budget will have the broadest effects upon the entire national economy.

All of these proposals become important to every citizen because they reach every segment of the economy.

On taxes . . .

The program which perhaps has the greatest direct interest to the petroleum industry, as to most individuals and business activity, is that on taxes.

The President's budget message contained many fundamental tax proposals. Of first importance to the oil industry was the absence of any proposal to alter the oil and gas depletion provision and option on intangible costs.

The most significant feature of the President's tax program is what appears to be an overriding objective of providing a new stimulus to investment capital and business expansion. This is encouraging to the oil industry because it seems to stand in refutation of the rumors that have persisted in recent months to the effect that there would be proposals to revise the oil and gas depletion provision. It would seem inconsistent to single out one industry, especially one so essential to defense, for a reduction in incentive with the over-all program just to the contrary.

Yet, there is in the President's budget message a reference to the effect that "the review of the present tax system in the Treasury Department has not yet led to final conclusions" on subjects including "the special problems of the oil and mining industries." There is no further explanation in the message. It has been reported in the press, however, that Secretary of the Treasury Humphrey, in response to inquiry as to the meaning of the statement, said that no recommendations on depletion would be made to Congress this session. This no doubt will keep alive the concern that some proposal may come next session from the Treasury Department.

Tax recommendations which would provide increased incentive particularly to new and small growing businesses are those on

- Depreciation
- Double taxation of dividends
- Loss carryback
- Accumulation of earnings

There long has been in evidence a need for more flexible treatment of depreciation. The President's program recognizes this need.

The long standing demands for relief from the double taxation of dividends have now reached the form of a definite proposal.

The proposals to permit a two year loss carryback instead of the present one year limit and the liberalization of the procedure on accumulation of earnings, would also be of benefit to many taxpayers, particularly small businesses.

The Ways and Means Committee for more than a year has had under study a general revision of the tax code and has already or is expected to approve in substance, these proposals of the President. This, if events run true to form, is tantamount to assurance that some form of action will be taken during the current session.

The President's proposals calling for the extension of the present corporate income tax rate of 52 percent, which under present law is scheduled to drop to 47 percent on April 1, and the extension of certain excise taxes, including the two-cent-per-gallon tax on gasoline, which is scheduled to revert to 1½ cents on April 1, have brought forth rather strong opposition and it can be expected that the controversy will be a heated one. There has been some speculation of a compromise on 50 percent on the corporate rate.

Opposition due. The President's program also includes proposals which

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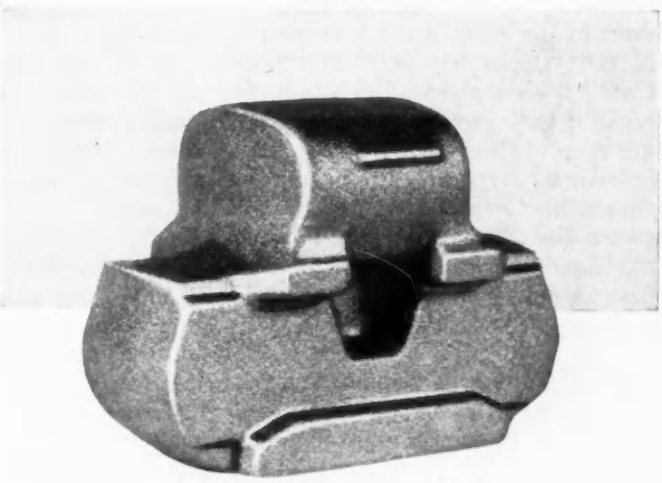

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favor income derived from foreign investments. These recommendations are more a part of the foreign trade program than of the tax program. Included is a recommendation for more liberal credit for foreign taxes paid, along with a program of guarantees against risk of war, confiscation and inconvertibility of currencies.

This latter recommendation on foreign investments can be expected to run into strong opposition in Congress. In substance, the same recommendation has more recently appeared in the Report of the Commission on Foreign Economic Policy (Randall Commission). There it met the dissents of the leaders of the Congressional Tax Committees, Senator Millikin, Chairman of the Senate Finance Committee, and Congressman Reed, Chairman of the House Ways and Means Committee. Senator Millikin, in a strong dissent characterized the recommendation as "tax favoritism" and the "equivalent of subsidies." This reaction would indicate doubt as to approval of this recommendation during the present session.

On foreign trade policy . . .

One of the most controversial issues to be before Congress, which bears upon the import issue within the petroleum industry, is that of foreign trade. The Trade Agreements Act expires this June and the administration is expected to offer a program.

The Randall Report, recently submitted to the President, has been anticipated as the document to set administration policy and as providing the framework of the administration's legislative program. It is a somewhat cautions report, falling far short of the goals of the protagonists of the "trade, not aid" and "free trade" philosophies. Even so, it brought forth sweeping dissents from members of Congress, including three influential Republican members chosen by Congress to serve on the commission. The hope that through the Randall Report the Republican party would be united on a trade program seems to have been lost.

Watered down. The report is much watered down from the liberalized recommendations that were made by the free trade advocates and had the sympathies of many of the commission members. It recommends a three-year extension of the Trade Agreements Act instead of a ten-year extension or permanent law desired by the pro-liberalized trade groups. It abandons the objective of wiping out the "peril point" and "escape clause" provisions of the present law. It proposes amendment to the Buy American Act, rather than abolution. It avoided the issue of federal subsidies to domestic industries, workers, and communities injured by lower import duties.

As to the domestic petroleum industry with respect to the import problem the report offers a plan that would continue the policy of recent years of encouraging foreign oil development and increased imports. This is revealed in its recommendations to the effect that (1) security or defense factors should not be considered in tariff or trade policy, (2) that income from foreign sources should be favored over domestic income and (3) that the President's authority to make further reductions in tariffs should be continued.

On natural gas . . .

The long standing and widespread concern over the threat of federal regulation of the field sales of natural gas producers was added to by the adverse decision of the U. S. Court of Appeals for the District of Columbia which was handed down last May in the Phillips Petroleum Company case. The Federal Power Commission after an exhaustive investigation had previously held that it did not have jurisdiction over the field sales of the Phillips Company.

The Court of Appeals reversed this decision and held that the FPC must regulate such sales. It was the hope of the industry that the decision would serve to clarify with some definiteness the limits of federal jurisdiction and spell out the criteria for determining jurisdiction or absence thereof. To the contrary, the decision not only failed to clarify the issue but added to the confusion and uncertainty.

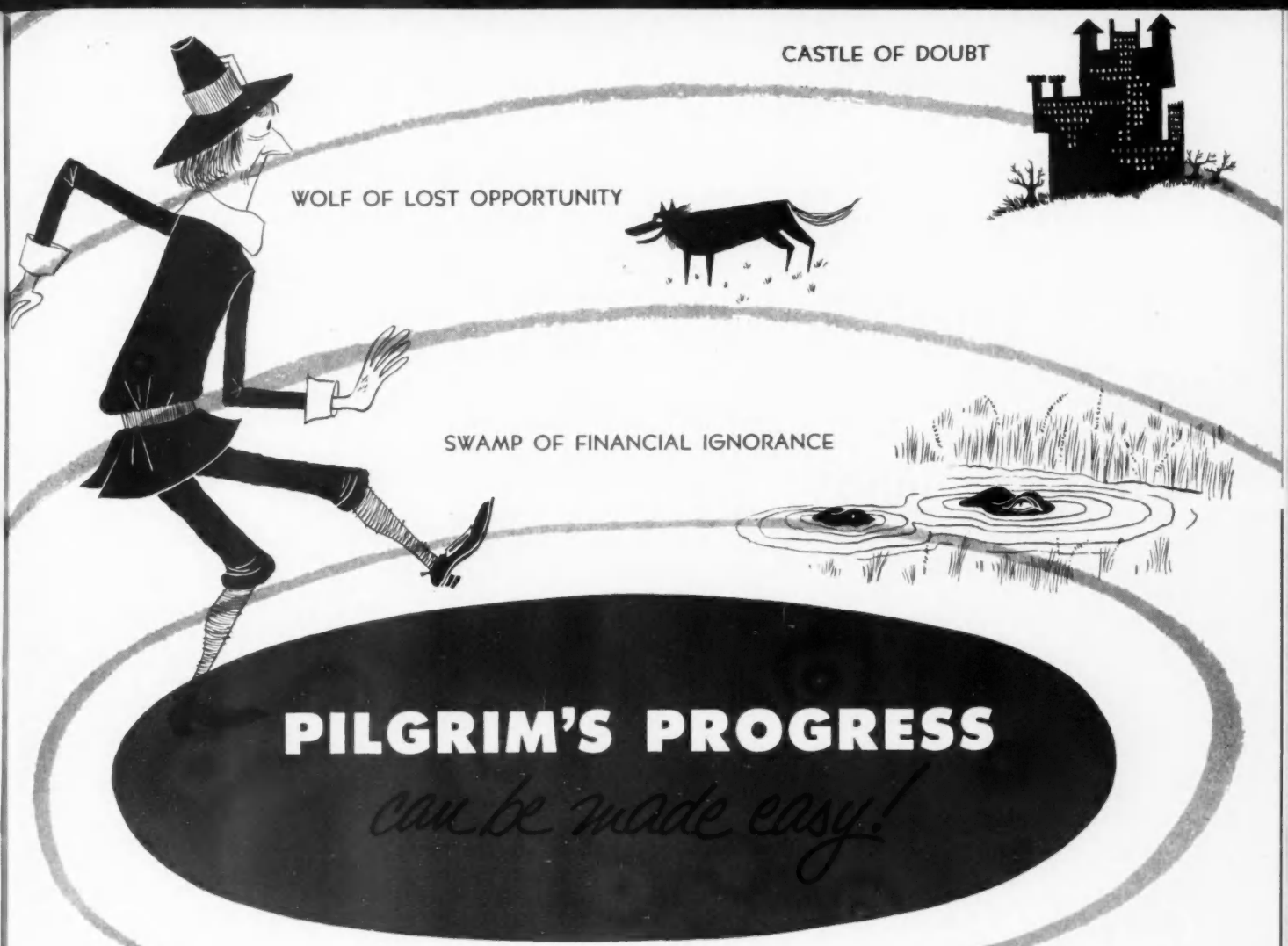
The Supreme Court recently agreed, after previously refusing to do so, to review the lower court decision. The industry again is looking to the court's determination of this case with the hope that the matter will be reduced to some degree of clarification.

Lyle Bill. Early last year Congressman Lyle of Texas introduced a bill aimed at clarifying the exemption of production and gathering provided in the Natural Gas Act. This bill is still before Congress. It was not acted upon last year, and in view of this pendency of the matter in the Supreme Court, there is considerable feeling that legislative action on the question should await the court decision. In view of this situation, it appears unlikely that there will be any final action this session on this type of legislation.

Another gas matter now before Congress and somewhat related to that concerning the production and gathering of gas is the question of FPC jurisdiction over local distribution and related transportation activities. Last year a bill (H. R. 5976) introduced by Congressman Hinshaw of California providing for the exemption from FPC jurisdiction of such activities which take place wholly within the state where the gas is consumed and is subject to state regulations, passed the House and was favorably reported by the Senate Interstate and Foreign Commerce Committee.

But when it came up for consideration on the consent calendar in the Senate it was objected to and therefore was prevented from being considered. Already during the current session it again came up on the consent calendar and was objected to by Senator Gore of Tennessee. Last year it was thought that there was general approval of the bill from all groups concerned. Later in the year, however, the National Institute of Municipal Law Officers, which previously had voiced no opposition and apparently approved the bill, went on record as opposing enactment.

In view of these developments, there appears little likelihood that this



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legislation will clear the Senate this session.

Other gas matters. There are a number of other gas matters before the Congress, including the underground storage bill (S. 525) introduced by Senators Douglas and Dirksen of Illinois. A similar bill was introduced by them in the previous Congress. Also before Congress are bills by Senator Hunt of Wyoming and Congressman Stringfellow of Utah (S. 1287 and H. R. 4227), which would amend the Natural Gas Act. They are aimed at restricting the importation of natural gas and have been supported by the coal industry, which has vigorously opposed the proposed importation of Canadian gas into the Pacific Northwest market. None of these bills received active consideration by Congress during the past session, and in view of the crowded schedule this year, their chances of clearing the legislative processes seem remote.

On public lands . . .

There are a number of public land matters now pending before Congress which may receive consideration this session. In view of the must legislation and the plan for early adjournment it is difficult to speculate as to whether these matters will be processed completely by Congress and enacted into law before adjournment.

One matter which seems destined for Congressional attention during the current session, or perhaps more likely the next Congress, arises from a basic conflict between the General Mining Laws of 1872 and the Mineral Leasing Act of 1920. The problem arises out of the co-existence of these two distinct systems under which the exploration for and development of mineral resources of the public domain is conducted. The mining laws in their operation obstruct, in some respects, the development of oil and gas and other non-metallic minerals covered by the Mineral Leasing Act of 1920. Likewise, the Mineral Leasing Act operates to obstruct the development of metaliferous and other minerals subject to the mining laws.

The conflict has been in evidence for many years, but recently has been aggravated by the increased activity in the search for and development of uranium and other fissionable source materials. This has been particularly true in the Colorado plateau area, where there is very active interest with respect to both fissionable materials and oil and gas.

There are two general areas of conflict. One faces the mine locator, arising as a result of permits or leases under the Mineral Leasing Act which, when issued, have the effect of withdrawing the land involved from mining locations under the general mining law; the other faces the oil and gas operator, arising from the title uncertainties growing out of unpatented mining claims, based upon locations that may be made many years ago.

During the last session of Congress, S. 1397 (Public Law 250), was passed which gave stop-gap relief to a number of mining claimants seeking development of fissionable materials, who found their claims invalid by reason of being located on lands covered by oil and gas leases. The law has no prospective effect, merely validating such claims located during the period Aug. 1, 1939 through Dec. 31, 1952.

There has been a growing recognition that these conflicts should be resolved so that there may be a maximum multiple use of the public lands. Both the mining industry and the petroleum industry have indicated a willingness to seek an amicable disposition of this problem. The National Petroleum Council at its Dec. 3, 1953, meeting received the report of its committee which made a study of the matter and recommended specific steps to be taken in seeking a solution to the problem.

Although this might be brought to the attention of the Congress during the current session, in view of the complicated nature of the problem and the difficulty in modifying long-established procedure without creating new inequities, the time limit will make it difficult to solve the matter legislatively during the present session.

Rental waiver. A matter that was before the previous Congress and is again pending is that raised by H. R. 335, introduced by Congressman Regan of Texas. This bill would eliminate the waiver of rentals on oil and gas leases for the second and third years, as is now provided in the Mineral Leasing Act. There has been strong opposition to this bill from independent oil producers operating in the public land states. It is their position that the bill reflects the erroneous philosophy that the public lands should be used as a source of federal revenue. They contend that the great development that has taken place under the Mineral Leasing Act flows from the basic objective of that law of stimulating development, not as a revenue measure.

The bill was reported favorably last year by the House Interior and Insular Affairs Committee and was sent to the House Rules Committee, which did not act on the bill, and it remains there. The Senate did not consider the bill. It may be expected that during the current session renewed efforts will be made to clear this proposal for further consideration by the Congress. If it should clear the House it can be expected to encounter vigorous opposition in the Senate.

Several other bills now are pending in Congress which propose to revise the Mineral Leasing Act and may receive consideration during the current Congress. Among these are proposals to increase the acreage limitation on oil and gas leases, to remove certain inequities that result under the present law in extending a lease, and to make leases co-extensive with the life of the unit plan in which they may be included.

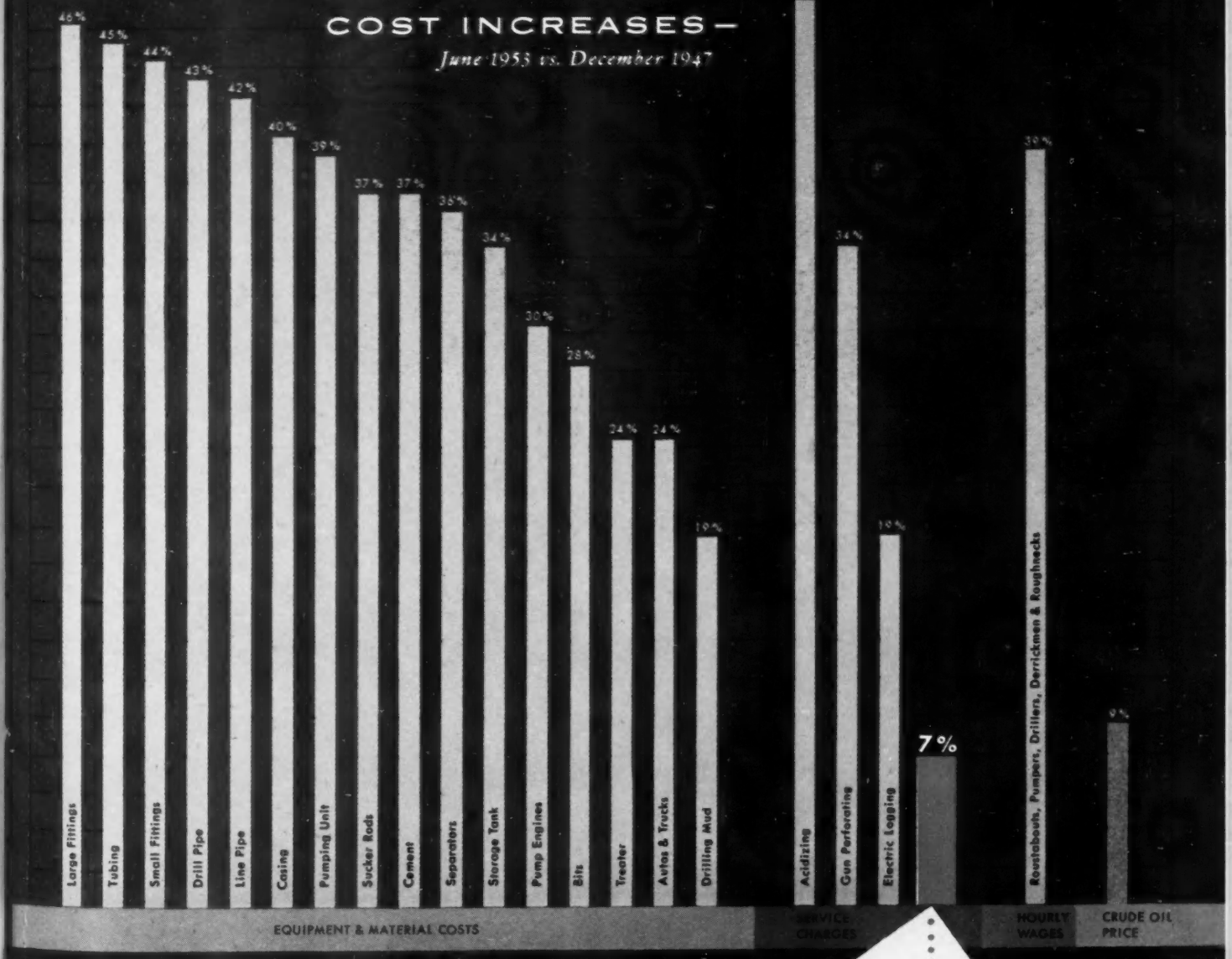
There is some feeling that the Mineral Leasing Act should at this time be generally reviewed by the Congress so as to better coordinate any needed changes. It has been eight years since it was amended to any substantial extent, and although the law as it now stands has stimulated development and resulted in great benefit to the public land states, the experience of the past eight years has revealed a number of changes that seem desirable. For this reason, there are some who feel it would be advisable to make a general review of the Mineral Leasing Act. This approach would perhaps involve more time than will be possible this session.

—The End

Exploration Section

WORLD OIL

L. J. LOGAN, SECTION EDITOR



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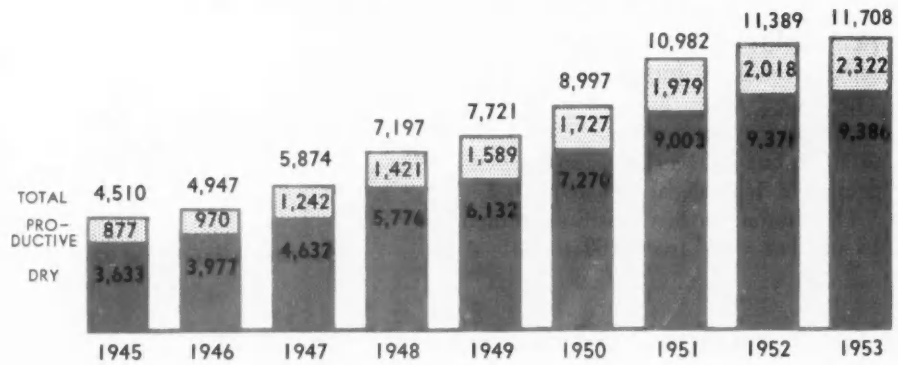


Exploration Record . . . 11,708 tests

completed in '53 for new all-time mark.

By CECIL W. SMITH, WORLD OIL Staff

THE INDUSTRY'S greatest exploratory drilling effort of all time was turned in during 1953, when 11,708 tests were completed. That amounted to an increase of 2.8 percent, or 319 wells, over the previous peak of 11,389 recorded in 1952. The year's record-breaking operations also marked the 12th consecutive year in which exploratory drilling has overshadowed the preceding year's activity. Since the opening of World War II, the search for new sources of oil and gas has continued to increase.

The 1954 outlook is for an even more active wildcatting program than ever. WORLD OIL has forecast the drilling of 11,167 wildcats—not including new pay and extension tests included in above totals—in the present year. That would be an increase of 4.6 percent over the 1953 record of 10,675 rank wildcats. There will be ample steel for such a program, but an offsetting factor is the possibility of a cut in crude prices.

The refining industry, despite record rates of oil consumption, has amassed vast quantities of gasoline. Unless this condition is tempered with lower refining rates, gasoline prices probably will suffer price reductions before the arrival of the heavy demand season. Gasoline is the money product of the refining process, and if a price cut occurs there is a possibility it will be reflected in crude prices at the well. A price slash would certainly dampen wildcatters' enthusiasm.

Successes High. Not only were 1953's exploratory wells—strict wildcats, new pay and extension tests—more numerous than ever before, but they were above average as to success. Of the tests completed last year, 2322 were commercial producers of oil, distillate, or gas for a score of 19.8 percent. A year earlier, the best the nation's drillers could do was to bring in 2018 successful tests for a score of 17.7 percent of the total drilled.

Of the 2322 exploratory successes, 1914 opened new pools and the remaining 408 were major extensions to established fields. The new pools opened were by far the greatest number discovered in a single year. A year earlier the count had been 1652 new pools opened to production.

A total of 1464 new crude oil pools was opened during the year to top the previous high of 1350 in 1951. The current discoveries were comprised of 384 new pay horizons in existing fields and 1080 new oil fields. That was the first time in history that as many as 1000 new oil fields were discovered in a single year. Several times that mark was neared, but never quite attained. In 1952, 982 new oil fields were found. The previous peak had been 992 in 1951.

The preceding figures concerned exploratory wells which included wildcats, new pay tests in established fields, and outposts to existing producing areas. The year's strict wildcats were also at an all-time peak, numbering 10,675 and comparing with the previous high of 10,239 completed in 1952. The year's wildcats accounted for 22.4 percent of the nation's total drilling and that was second only to the previous year's 22.6 percent. Only once before in the past 17 years had wildcats amounted to as much as 20 percent of total wells drilled and that was in 1951.

Short of 1952. The year's wildcatting results were better than average,

YEAR	Total New Oil, Gas and Distillate Sources Found			New Oil Sources Found			New Gas Sources Found			New Distillate Sources Found		
	Total	New Fields	New Pays	Total	New Fields	New Pays	Total	New Fields	New Pays	Total	New Fields	New Pays
1937	376	239	137	322	203	119	48	33	15	6	3	3
1938	423	264	159	373	229	144	42	31	11	8	4	4
1939	473	258	215	414	224	190	55	33	22	4	1	3
1940	492	309	183	428	261	167	62	46	16	2	2	0
1941	650	362	288	562	301	261	83	58	25	5	3	2
1942	523	348	175	451	288	163	57	47	10	15	13	2
1943	499	347	152	403	276	127	72	56	16	24	15	9
1944	633	460	173	475	326	149	117	102	15	41	32	9
1945	647	451	187	475	317	158	128	113	15	44	30	14
1946	688	412	276	513	308	205	104	75	29	71	29	42
1947	979	576	403	736	436	300	145	96	49	98	44	54
1948	1192	792	400	917	610	307	160	112	48	115	70	45
1949	1264	867	397	964	668	296	179	130	49	121	69	52
1950	1376	1015	361	1119	811	308	172	137	35	85	67	18
1951	1662	1226	436	1350	992	358	223	172	51	89	62	27
1952	1652	1267	385	1294	982	312	223	174	49	135	111	24
1953	1914	1421	493	1464	1080	384	294	244	50	156	97	59

but did not quite measure up to the 1952 score. A total of 1421 wildcats proved to be producers and they amounted to 13.3 percent of the total wildcats drilled. The previous year's record was a better 14.1 percent.

Each of the three leading wildcatting states in the nation upped their activity during 1953 and two of them are expected to be scenes of further hikes during 1954, the other is scheduled for a very slight decline. Texas, the No. 1 wildcat state, saw its wells increase 5.6 percent from 4592 in 1952 to 4847 in 1953. This year they are expected to number about 4983. The No. 2 state, Kansas, enjoyed a small wildcatting increase, 1040 wells to 1029, but 1954's operations are expected to drop slightly to 1018.

Oklahoma, in third position, gained 13 wildcat wells from 862 to 875. A sizable hike to 920 wells in 1954 has been predicted for the Sooner state.

Wildcatters apparently have added South Dakota as the 28th oil producing state in the nation. Not included in 1953 statistics is a discovery well located in Harding County which was still being tested as the year closed.

(See table Pages 91 and 92)

Ratio of Wildcatting to All Drilling and Proportion of Wildcats Discovering New Fields, by Districts, 1937-1953

STATE or DISTRICT	SIXTEEN YEARS, 1937-1952						YEAR 1953					
	Total New Wells Drilled for Oil or Gas	*STRICT WILDCATS					Total New Wells Drilled for Oil and Gas	*STRICT WILDCATS				
		TOTAL			PRODUCTIVE			TOTAL			PRODUCTIVE	
		Number	Percent of All Wells	Dry	Number	Percent of All Strict Wildcats		Number	Percent of All Wells	Dry	Number	Percent of All Strict Wildcats
Alabama	392	251	64.0	244	7	2.8	107	80	74.8	80	.....	.....
Arizona	47	47	100.0	47	.....	.....	6	6	100.0	6	.....	.....
Arkansas	4,403	1,084	24.6	990	94	8.7	553	149	26.9	136	13	8.7
California	27,734	3,848	13.9	3,629	219	5.7	2,575	470	18.3	435	35	7.4
Colorado	1,804	688	38.1	627	61	8.9	699	339	48.5	297	42	12.4
Florida	169	153	90.5	152	1	.7	33	33	100.0	33	.....	.....
Georgia	46	46	100.0	46	.....	.....	9	9	100.0	9	.....	.....
Idaho	8	8	100.0	8	.....	.....	4	4	100.0	4	.....	.....
Illinois	38,972	8,188	21.0	7,727	461	5.6	2,164	487	22.5	460	27	5.5
Indiana	10,749	3,108	28.9	2,828	280	9.0	1,295	397	30.7	368	29	7.3
Iowa	22	22	100.0	22	.....	.....	.....	.....	.....	.....	.....	.....
Kansas	39,608	7,177	18.1	6,074	1,103	15.4	4,406	1,040	23.6	879	161	15.5
Kentucky	15,944	1,668	10.5	1,497	171	10.3	1,389	134	9.6	112	22	16.4
Louisiana	25,145	3,547	14.1	3,048	499	14.1	2,730	444	16.3	383	61	13.7
North Louisiana	13,292	1,946	14.6	1,783	163	8.4	1,248	210	16.8	200	10	4.8
South Louisiana	11,853	1,601	13.5	1,265	336	21.0	1,482	234	15.8	183	51	21.8
Maryland	86	11	12.8	9	2	18.2	5	.....	.....	.....	.....	.....
Michigan	13,496	4,197	31.1	3,893	304	7.2	622	273	43.9	254	19	7.0
Mississippi	3,900	1,440	36.9	1,357	83	5.8	422	214	50.7	197	17	7.9
Missouri	898	238	26.5	234	4	1.7	45	10	22.2	10	.....	.....
Montana	4,019	458	11.4	403	55	12.0	409	128	31.3	115	13	10.2
Nebraska	906	529	58.4	490	39	7.4	314	157	50.0	135	22	14.0
Nevada	6	6	100.0	6	.....	.....	8	8	100.0	8	.....	.....
New Jersey	9,002	1,103	12.3	925	178	16.1	1,446	201	13.9	134	67	33.3
New Mexico	1	1	100.0	1	.....	.....	.....	.....	.....	.....	.....	.....
New York	12,961	86	.7	84	2	2.3	566	.....	.....	.....	.....	.....
North Carolina	17	17	100.0	17	.....	.....	1	1	100.0	1	.....	.....
North Dakota	130	48	36.9	42	6	12.5	269	92	34.2	82	10	.....
Ohio	17,865	443	2.5	392	51	11.5	964	13	1.3	13	.....	.....
Oklahoma	49,015	6,553	13.4	5,524	1,029	15.7	7,221	875	12.1	709	166	19.0
Oregon	12	12	100.0	12	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	30,709	125	.4	88	37	29.6	876	.....	.....	.....	.....	.....
South Carolina	7	7	100.0	7	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	49	49	100.0	49	.....	.....	22	22	100.0	22	.....	.....
Tennessee	579	306	52.8	288	18	5.9	52	2	3.8	1	1	50.0
Texas	174,704	31,486	18.0	27,178	4,308	13.7	16,953	4,847	28.6	4,185	662	13.7
Dist. 1: South Central	5,873	2,448	41.7	2,298	150	6.1	857	339	39.6	312	27	8.0
Dist. 2: Middle Gulf	[1]	[1]	100.0	[1]	[1]	100.0	807	315	39.0	275	40	12.7
Dist. 3: Upper Gulf	17,284	3,044	17.6	2,617	427	14.0	1,672	433	25.9	382	51	11.8
Dist. 4: L. Gulf-S.W.	31,732	7,031	22.2	6,066	965	13.7	1,830	577	31.5	480	97	16.8
Dist. 5: East Central	[2]	[2]	100.0	[2]	[2]	100.0	275	122	44.4	115	7	5.7
Dist. 6: Northeast	15,922	2,277	14.3	2,104	173	7.6	515	162	31.5	145	17	10.5
Dist. 7-B: North Cent.	[3]	[3]	100.0	[3]	[3]	100.0	3,108	1,129	36.3	956	173	15.3
Dist. 7-C: West Cent.	[4]	[4]	100.0	[4]	[4]	100.0	1,315	422	32.1	354	68	16.1
Dist. 8: West	43,177	4,578	10.6	3,851	727	15.9	2,369	455	19.2	378	77	17.0
Dist. 9: North	50,982	11,894	23.3	10,044	1,850	15.6	3,585	878	24.5	775	103	11.7
Dist. 10: Panhandle	9,734	214	2.2	198	16	7.5	620	15	2.4	13	2	13.3
Utah	255	162	63.5	151	11	6.8	81	57	70.4	45	12	21.1
Virginia	130	31	23.8	22	9	29.0	.....	.....	.....	.....	.....	.....
Washington	31	31	100.0	31	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	12,143	122	1.0	81	41	33.6	607	.....	.....	.....	.....	.....
Wyoming	4,755	883	18.6	754	129	14.6	887	183	20.6	141	42	23.0
Total U.S.	500,719	78,179	15.6	68,977	9,202	11.8	47,740	10,675	22.4	9,254	1,421	13.3
U.S. Total by Years, 1937-1952												
1937	32,474	2,182	6.7	1,943	239	11.0						
1938	27,764	2,443	8.8	2,179	264	10.8						
1939	26,654	2,746	10.3	2,488	258	9.4						
1940	29,161	2,982	10.2	2,672	310	10.4						
1941	30,149	3,409	11.3	3,047	362	10.6						
1942	19,729	3,001	15.2	2,652	349	11.6						
1943	18,641	3,298	17.7	2,951	347	10.5						
1944	23,733	3,885	16.4	3,425	460	11.8						
1945	24,482	3,946	16.1	3,486	460	11.7						
1946	28,145	4,242	15.1	3,830	412	9.7						
1947	31,084	4,983	16.0	4,407	576	11.6						
1948	37,448	6,410	17.1	5,618	792	12.4						
1949	37,812	6,781	17.9	5,914	867	12.8						
1950	42,173	7,891	18.7	6,876	1,015	12.9						
1951	45,996	9,778	21.3	8,552	1,226	12.5						
1952	45,275	10,239	22.6	8,972	1,267	14.1						

* Exclusive of all tests seeking new pay zones or outposts attempting to extend known fields.
[1] Dist. 2 included with Dist. 4.
[2] Dist. 5 included with Dist. 6.
[3] Dist. 7-B included with Dist. 9.
[4] Dist. 7-C included with Dist. 8.

Results of Exploratory Drilling in the United States in 1953, by States, and Comparison with Earlier Years

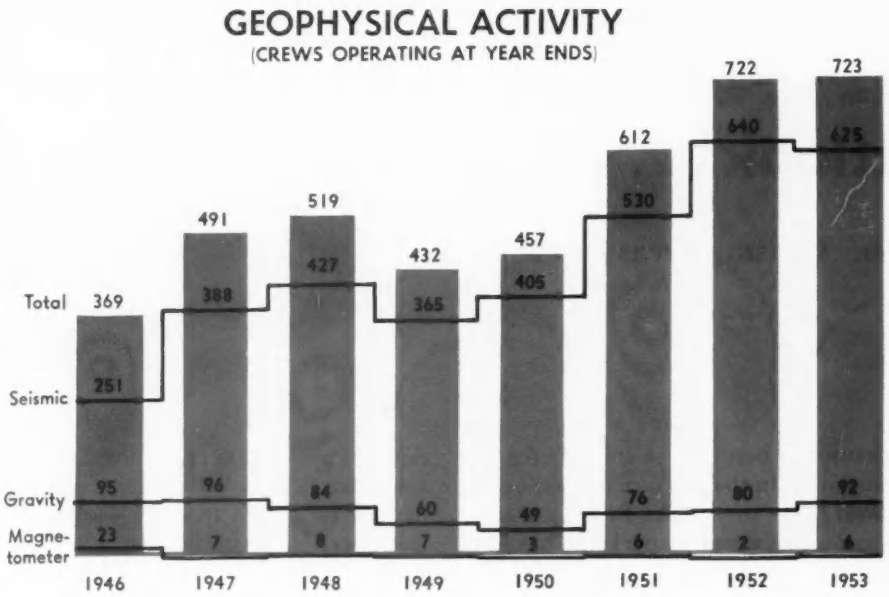
(Based on Data Compiled by Staff of WORLD OIL)

Part 1: Productive Tests

STATE or DISTRICT	OIL									DISTILLATE									GAS									TOTAL PRODUCTIVE		
	New Fields			New Pays			Extensions			New Fields			New Pays			Extensions			New Fields			New Pays			Extensions					
	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth	No	Footage	Avge. Depth	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth	No.	Footage	Avge. Depth
Arkansas	12	69,453	5788	13	46,960	3612	4	21,037	5259	..	.....	.....	..	.....	.....	..	.....	.....	1	586	586	..	.....	.....	1	6,972	6972	31	145,008	4678
California	27	124,592	4615	32	195,476	6109	15	86,672	5778	..	.....	.....	..	.....	.....	..	.....	.....	8	34,248	4281	6	22,169	3695	1	1,650	1650	89	464,807	5223
Colorado	29	159,997	5517	1	5,430	5430	2	12,100	6050	2	11,524	5762	..	.....	.....	..	.....	.....	11	57,449	5223	1	8,406	8406	..	.....	.....	46	254,906	5541
Illinois	26	66,955	2575	14	36,587	2613	44	129,572	2945	..	.....	.....	..	.....	.....	..	.....	.....	1	428	428	..	.....	.....	1	258	258	86	233,800	2719
Indiana	27	41,192	1526	3	4,078	1359	6	12,856	2143	..	.....	.....	..	.....	.....	..	.....	.....	2	3,396	1698	1	824	824	..	.....	.....	39	62,346	1599
Kansas	139	523,494	3766	5	17,103	3421	5	19,148	3830	..	.....	.....	..	.....	.....	..	.....	.....	22	104,439	4747	..	.....	.....	4	24,500	6123	175	688,684	3935
Kentucky	21	43,452	2069	..	.....	.....	2	4,838	2419	..	.....	.....	..	.....	.....	..	.....	.....	1	2,159	2159	..	.....	.....	..	.....	.....	24	50,449	2102
Louisiana	34	317,863	9349	44	439,983	10000	10	67,077	6708	18	195,391	10855	11	125,979	11453	5	58,661	11732	9	99,070	11008	10	103,443	10344	1	11,500	11500	142	1,418,967	9993
North Louisiana	6	46,660	7777	5	32,596	6519	7	34,178	4883	4	38,148	9537	1	10,072	10072	..	.....	.....	..	.....	.....	2	18,147	9074	..	.....	.....	25	179,801	7192
South Louisiana	28	271,203	9686	39	407,387	10446	3	32,899	10966	14	157,243	11232	10	115,907	11591	5	58,661	11732	9	99,070	11008	8	85,296	10662	1	11,500	11500	117	1,239,166	10591
Michigan	14	37,860	2704	4	16,085	4021	5	13,642	2728	..	.....	.....	..	.....	.....	..	.....	.....	5	13,625	2725	..	.....	.....	..	.....	.....	28	81,212	2900
Mississippi	12	87,582	7299	7	56,345	8049	2	15,719	7859	2	14,767	7384	1	8,652	8652	1	7,010	7010	3	17,425	5808	..	.....	.....	..	.....	.....	28	206,500	7375
Montana	11	76,350	6941	..	.....	.....	2	15,511	7756	..	.....	.....	..	.....	.....	..	.....	.....	2	3,751	1876	..	.....	.....	..	.....	.....	15	95,612	6374
Nebraska	19	105,238	5539	..	.....	.....	4	21,874	5469	..	.....	.....	1	12,431	12431	..	.....	.....	3	12,974	4325	..	.....	.....	..	.....	.....	27	145,161	5376
New Mexico	25	214,526	8581	3	23,161	7720	5	28,212	5642	..	.....	.....	..	.....	.....	..	.....	.....	42	208,807	4972	1	3,488	3488	5	27,047	5409	82	517,672	6313
North Dakota	9	63,371	7041	1	13,325	13325	4	28,689	7172	..	.....	.....	..	.....	.....	..	.....	.....	1	303	303	..	.....	.....	..	.....	.....	15	105,688	7046
Ohio	..	.....	.....	..	.....	.....	2	6,321	3161	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	2	7,210	3605	4	9,402	2351	8	22,933	2867
Oklahoma	130	619,334	4764	30	171,235	5708	77	364,661	4736	6	35,980	5997	1	6,570	6570	2	12,243	6122	30	129,773	4326	3	10,030	3343	10	53,477	5348	289	1,403,303	4856
Pennsylvania	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	1	6,892	6892
Tennessee	1	1,134	1134	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	1	1,134	1134
Texas	503	2,532,818	5035	224	1,336,263	5965	134	648,350	4838	69	575,664	8343	45	348,574	7746	20	152,183	7609	90	516,390	5738	26	161,699	6219	25	166,352	6654	1136	6,438,293	5668
Dist. 1: S. Central	20	62,160	3108	1	1,460	1460	2	9,518	4759	2	18,400	9200	2	13,757	6879	1	8,050	8050	5	21,213	4243	1	387	387	..	.....	.....	34	134,945	3969
Dist. 2: Middle Gulf	15	106,905	7127	9	45,975	5108	5	31,943	6389	11	93,559	8505	5	33,175	6635	1	8,070	8070	14	80,354	5740	2	7,057	3529	5	34,008	6802	67	441,046	6583
Dist. 3: Upper Gulf	25	189,895	7596	45	314,906	6998	10	85,662	8566	16	132,141	8259	17	146,222	8601	11	86,459	7860	10	83,243	8324	11	77,133	7012	8	56,522	7065	153	1,172,183	7661
Dist. 4: L. Gulf-SW	40	218,331	5458	61	408,770	6701	2	14,765	7383	29	247,679	8544	18	138,687	7705	4	33,547	8387	28	176,346	6298	8	57,694	7212	5	34,444	6889	195	1,330,263	6822
Dist. 5: East Cent.	5	23,683	4737	2	13,934	6967	..	.....	.....	1	8,563	8563	1	7,653	7653	..	.....	.....	1	8,053	8053	..	.....	.....	..	.....	.....	10	61,886	6189
Dist. 6: Northeast	13	72,641	5588	6	39,513	6586	2	13,180	6590	3	20,938	6979	..	.....	.....	1	6,908	6908	1	7,005	7005	..	.....	.....	1	6,475	6475	27	166,660	6173
Dist. 7-B: N. Cent.	156	556,808	3569	32	119,630	3738	27	79,706	2952	..	.....	.....	..	.....	.....	1	4,019	4019	17	53,293	3135	1	3,511	3511	2	4,867	2434	236	821,834	3482
Dist. 7-C: W. Cent	56	276,485	4937	17	77,326	4549	9	55,670	6186	6	48,674	8112	1	2,200	2200	..	.....	.....	6	42,108	7018	..	.....	.....	..	.....	.....	95	502,463	5289
Dist. 8: West	74	573,811	7754	19	166,478	8762	32	207,560	6486	1	5,710	5710	1	6,880	6880	..	.....	.....	2	10,063	5032	1	4,322	4322	1	15,324	15324	131	990,148	7558
Dist. 9: North	97	442,559	4562	32	148,271	4633	44	146,181	3322	..	.....	.....	..	.....	.....	1	5,130	5130	6	34,712	5785	2	11,595	5798	2	11,263	5632	184	799,711	4346
Dist. 10: Panhandle	2	9,540	4770	..	.....	.....	1	4,165	4165	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	1	3,449	3449	4	17,054	4264
Utah	4	29,631	7408	..	.....	.....	1	5,919	5919	..	.....	.....	..	.....	.....	..	.....	.....	8	38,505	4813	..	.....	.....	..	.....	.....	13	74,055	5697
Wyoming	37	251,067	6786	3	31,588	10529	2	5,630	2815	..	.....	.....	..	.....	.....	..	.....	.....	5	19,574	3915	..	.....	.....	..	.....	.....	47	307,859	6550
U. S. Total, 1953	1080	5,364,909	4968	384	2,393,619	6233	326	1,507,828	4625	97	833,326	8591	59	502,206	8512	27	230,097	8218	244	1,262,902	5176	50	317,269	6345	54	313,126	5799	2322	12,725,282	5480
Earlier Years																														
1937	203	831,123	4094	119	615,007	5168	3	9,036	3012	3	19,377	6459	3	24,574	8191	..	.....	.....	33	77,389	2345	15	51,145	3410	..	.....	.....	379	1,627,651	4295
1938	229	944,455	4124	144	815,186	5661	7	25,027	3575	4	23,657	5914	4	27,115	6779	..	.....	.....	31	102,440	3350	11	49,634	4512	3	12,042	4014	433	1,999,556	4618
1939	224	782,289	3492	190	998,595	5256	..	.....	.....	1	7,999	7999	3	24,709	8236	..	.....	.....	33	103,450	3135	22	92,626	4210	..	.....	.....	473	2,009,668	4249
1940	262	957,167	3667	167	914,442	5476	..	.....	.....	2	12,792	6396	..	.....	.....	..	.....	.....	46	122,439	2662	16	55,983	3499	..	.....	.....	493	2,062,823	4193
1941	301	1,165,966	3874	261	1,335,648	5117	..	.....	.....	3	23,505	7835	2	7,109	3555	..	.....	.....	58	177,974	3069	25	89,263	3571	..	.....	.....	650	2,799,465	4307
1942	288	1,199,382	4165	163	879,116	5393	..	.....	.....	13	121,620	9355	2	13,517	6759	..	.....	.....	48	167,428	3562	10	50,712	5071	..	.....	.....	524	2,431,775	4650
1943	276	1,232,396	4465	127	565,454	4452	132	559,090	4236	15	140,564	9371	9	88,031	9781	3	25,589	8530	56	212,814	3800	16	90,372	5648	10	58,996	5990	644	2,973,306	4617
1944	326	1,422,250	4363	149	731,764	4911	135	659,987	4889	32	250,228	7820	9	75,436	8382	10	79,797	7980	102	417,944	4097	15	95,099	6340	27	111,174	4118	805	3,843,679	4775
1945	317	1,503,763	4774	158	894,688	5663	154	702,822	4564	30	269,915	8997	14	140,464	10033	6	54,162	9027	113	486,529	4306	15	67,455	4497	70	216,103	3087	877	4,335,901	4944
1946	308	1,359,787	4415	205	1,227,305	5987	160	707,585	4422	29	264,441	9119	42	411,425	9796	7	63,111	9016	75	272,564	3634	29	166,588	5744	115	406,774	3537	970	4,879,580	5030
1947	436	1,999,100	4585	300	1,564,181	5214	169	693,950	4106	44	352,691	8016	54	505,112	9354	17	136,258	8015	96	403,038	4198	49	223,026	4552	77	254,076	3300	1242	6,131,432	4937
1948	610	2,760,127	4525	307	1,714,345	5584	170	758,977	4465	70	626,026	8943	45	432,625	9614	18	167,441	9302	112	514,990	4598	48	259,025	5396	41	162,801	3971	1421	7,396,357	5205
1949	668	3,027,759	4533	296	1,666,576	5630	273	1,233,190	4517	69	644,454	9340	52	459,017	8827	16	131,981	8249	130	626,058	4816	49	220,023	4490	36	141,146	3921	1589	8,150,204	5129
1950	811	3,607,484	4448	308	1,791,195	5816	290	1,388,816	4789	67	572,807	8549	18	164,699	9150	12	101,512	8459	137	679,851	4962	35	171,314	4895	49	221,808	4527	1727	8,699,486	5037
1951	992	4,767,425	4806	358	1,979,258	5529	242	1,226,022	5066	62	564,243	9101	27	231,253	8565	20	142,836	7142	172	937,257	5449	51	283,873	5566	55	253,494	4609	1979	10,385,661	5248
1952	982	4,751,818	4839	312	1,816,294	5821	292	1,406,498	4817	111	1,038,256	9354	24	195,502	8146	16	133,414	8338	174	924,735	5315	49	252,480	5153	58	319,288	5505	2018	10,838,285	5371

PART 2: Unproductive Tests and Total Exploratory Tests

STATE or DISTRICT	DRY WILDCATS			DRY NEW PAY TESTS			DRY OUTPOSTS			TOTAL DRY			TOTAL EXPLORATORY TESTS		
	No	Footage	Average Depth	No.	Footage	Average Depth	No.	Footage	Average Depth	No.	Footage	Average Depth	No.	Footage	Average Depth
Alabama	80	409,569	5120	....	.....	....	....	.....	....	80	409,569	5120	80	409,569	5120
Arizona	6	19,960	3327	....	.....	....	....	.....	....	6	19,960	3327	6	19,960	3327
Arkansas	136	528,770	3888	....	.....	....	1	3,426	3426	137	532,196	3885	168	677,204	4031
California	435	1,968,651	4526	1	10,030	10,030	32	161,126	5035	468	2,139,807	4572	557	2,604,614	4676
Colorado	297	1,551,397	5224	....	.....	....	....	.....	....	297	1,551,397	5224	343	1,806,303	5266
Florida	33	205,666	6232	....	.....	....	....	.....	....	33	205,666	6232	33	205,666	6232
Georgia	9	24,804	2756	....	.....	....	....	.....	....	9	24,804	2756	9	24,804	2756
Idaho	4	22,748	5687	....	.....	....	....	.....	....	4	22,748	5687	4	22,748	5687
Illinois	460	1,061,791	2308	....	.....	....	....	.....	....	460	1,061,791	2308	546	1,295,591	2373
Indiana	368	586,739	1594	....	.....	....	....	.....	....	368	586,739	1594	407	649,085	1595
Kansas	879	3,317,143	3774	....	.....	....	....	.....	....	879	3,317,143	3774	1,054	4,005,827	3801
Kentucky	112	228,802	2043	....	.....	....	....	.....	....	112	228,802	2043	136	279,251	2053
Louisiana	383	2,985,226	7794	....	.....	....	7	48,795	6971	390	3,034,021	7780	532	4,452,988	8370
North Louisiana	200	1,023,893	5119	....	.....	....	5	28,441	5688	205	1,052,334	5133	230	1,232,135	5357
South Louisiana	183	1,961,333	10,718	....	.....	....	2	20,354	10177	185	1,981,687	10,712	302	3,220,853	10665
Michigan	254	621,896	2448	....	.....	....	....	.....	....	254	621,896	2448	282	703,108	2493
Mississippi	197	1,334,914	6776	....	.....	....	6	49,362	8227	203	1,384,276	6819	231	1,590,776	6886
Missouri	10	14,092	1409	....	.....	....	....	.....	....	10	14,092	1409	10	14,092	1409
Montana	115	585,282	5089	....	.....	....	....	.....	....	115	585,282	5089	130	680,894	5238
Nebraska	135	644,586	4775	....	.....	....	2	9,871	4936	137	654,457	4777	164	799,618	4873
Nevada	8	11,842	1480	....	.....	....	....	.....	....	8	11,842	1480	8	11,842	1480
New Mexico	134	835,437	6235	....	.....	....	....	.....	....	134	835,437	6235	216	1,353,109	6264
North Carolina	1	1,570	1570	....	.....	....	....	.....	....	1	1,570	1570	1	1,570	1570
North Dakota	82	398,077	4855	....	.....	....	....	.....	....	82	398,077	4855	97	503,765	5193
Ohio	13	49,380	3798	....	.....	....	....	.....	....	13	49,380	3798	21	72,313	3443
Oklahoma	709	2,910,915	4106	....	.....	....	....	.....	....	709	2,910,915	4106	998	4,314,218	4323
Pennsylvania	....	.....	....	....	.....	....	....	.....	....	....	.....	....	1	6,892	6892
South Dakota	22	101,331	4600	....	.....	....	....	.....	....	22	101,331	4606	22	101,331	4606
Tennessee	1	2,269	2269	....	.....	....	....	.....	....	1	2,269	2269	2	3,403	1702
Texas	4,185	19,950,082	4767	....	.....	....	83	513,135	6182	4,268	20,463,217	4795	5,404	26,901,510	4978
Dist. 1: South Central	312	1,064,292	3411	....	.....	....	7	24,877	3554	319	1,089,169	3414	353	1,224,114	3468
Dist. 2: Middle Gulf	275	1,658,660	6031	....	.....	....	5	31,807	6361	280	1,690,467	6037	347	2,131,513	6143
Dist. 3: Upper Gulf	382	3,061,417	8014	....	.....	....	46	335,259	7288	428	3,396,676	7936	581	4,568,859	7864
Dist. 4: Lower Gulf-S.W.	480	2,599,890	5416	....	.....	....	4	28,778	7195	484	2,628,668	5431	679	3,958,931	5831
Dist. 5: East Central	115	480,071	4175	....	.....	....	....	.....	....	115	480,071	4175	125	541,957	4336
Dist. 6: Northeast	145	794,245	5478	....	.....	....	2	14,038	7019	147	808,283	5499	174	974,943	5603
Dist. 7-B: North Central	956	3,236,528	3385	....	.....	....	3	4,196	1398	959	3,240,724	3379	1,195	4,062,558	3400
Dist. 7-C: West Central	354	1,688,342	4769	....	.....	....	2	2,653	1327	356	1,690,995	4750	451	2,193,458	4864
Dist. 8: West	378	2,433,561	6438	....	.....	....	3	23,329	7776	381	2,456,890	6449	512	3,447,038	6732
Dist. 9: North	775	2,857,894	3688	....	.....	....	11	48,198	4382	786	2,906,092	3697	970	3,705,803	3820
Dist. 10: Panhandle	13	75,182	5783	....	.....	....	....	.....	....	13	75,182	5783	17	92,336	5432
Utah	45	233,109	5180	....	.....	....	....	.....	....	45	233,109	5180	58	307,164	5296
Wyoming	141	697,164	4944	....	.....	....	....	.....	....	141	697,164	4944	188	1,005,023	5346
U.S. Total, 1953	9,254	41,303,212	4463	1	10,030	10,030	131	785,715	5998	9,386	42,098,957	4485	11,708	54,824,239	4683
Earlier Years															
1937	1,943	7,173,550	3692	....	.....	....	....	.....	....	1,943	7,173,550	3692	2,322	8,801,201	3790
1938	2,179	7,012,901	3218	....	.....	....	....	.....	....	2,179	7,012,901	3218	2,612	9,012,457	3450
1939	2,488	7,764,816	3121	....	.....	....	....	.....	....	2,488	7,764,816	3121	2,961	9,774,484	3303
1940	2,672	8,649,828	3237	....	.....	....	....	.....	....	2,672	8,649,828	3237	3,165	10,712,651	3386
1941	3,047	9,651,013	3167	....	.....	....	....	.....	....	3,047	9,651,013	3167	3,697	12,450,478	3368
1942	2,652	9,320,691	3515	....	.....	....	....	.....	....	2,652	9,320,691	3515	3,176	11,752,466	3702
1943	2,951	10,702,429	3627	....	.....	....	36	164,155	4560	2,987	10,866,584	3638	3,631	13,839,890	3812
1944	3,425	13,470,846	3933	22	141,039	6411	73	383,802	5258	3,520	13,995,687	3976	4,325	17,839,366	4125
1945	3,486	14,504,642	4161	39	284,441	7293	108	375,062	3473	3,633	15,164,145	4174	4,510	19,500,046	4324
1946	3,830	14,399,824	3760	38	274,592	7226	109	418,919	3843	3,977	15,093,335	3795	4,947	19,972,915	4037
1947	4,407	17,068,382	3873	59	330,897	5608	166	659,738	3974	4,632	18,059,017	3899	5,874	24,190,449	4118
1948	5,618	22,227,790	3957	23	127,597	5548	135	574,023	4252	5,776	22,929,410	3970	7,197	30,325,767	4214
1949	5,914	22,044,695	3728	46	183,003	3978	172	747,516	4346	6,132	22,975,214	3747	7,721	31,125,418	4031
1950	6,876	25,882,014	3764	41	153,029	3732	353	1,507,382	4270	7,270	27,542,425	3789	8,997	36,241,911	4028
1951	8,552	34,526,359	4037	40	217,136	5428	411	1,810,582	4405	9,003	36,554,077	4060	10,982	46,939,738	4274
1952	8,972	39,430,757	4395	37	198,906	5376	362	1,483,634	4098	9,371	41,113,297	4387	11,389	51,951,582	4562



Geophysical Crews . . . Activity

again at record high; 751 crews busy in December.

The region employing the greatest number of crews in Texas was the West Texas area with 77, but the sharpest gain was scored by Southeast Texas, where 61 parties were working at year's end compared with 52 at the same time a year earlier.

Activity also picked up in New Mexico, which had 58 crews at year's end compared with 47 a year before.

California activity declined more sharply than in any other major producing area. This state had 6 fewer active seismic crews, 3 fewer gravity meter groups, and no magnetometer or core drilling units at year's end. This totaled 22 crews compared with 31 the year before.

Another state contributing to the minus column in over-all activity was North Dakota, which had 30 active seismic crews at the end of 1953 compared with 48 at the end of 1952. Neighboring Wyoming also slumped —from 44 seismic parties in 1952 to 38 a year later.

By contrast, Colorado, another mountain state, had 22 seismic crews —a gain of eight—in compiling a total of 26 busy crews at year's end. The year-end figure for 1952 was 17.

GEOPHYSICAL AND core drilling activity was again at a record high at year's end, with 751 crews busy against 741 in December of the previous year.

Greatest percentage gain was registered by core drilling, which had 35 crews afield at year's end. This compared with 19 crews for each of the previous two years.

Geophysical activity dropped to 716 crews at the end of last year from 722 at the end of 1952. This was due entirely to a slump for that period in seismic operations, which slowed to 620 crews from 640 the year before.

There were 92 gravity meter crews busy at the end of 1953, compared with 80 the year before; and 4 magnetometer groups compared with 2 the year before.

Texas and Louisiana were using the efforts of almost half the total geophysical and core drilling units busy at year's end. Of 355 working in the two states, 240 were in Texas and 115 in Louisiana. Of the latter total, South Louisiana was the locale of 108 parties, with only seven occupied in North Louisiana.

Geophysical and Core Drilling Activity at End of 1953 and 1952

(Figures represent number of crews. Data for 1952 as of December 31; for 1953, as of November 30. Source: Interstate Oil Compact Commission.)

	GEOPHYSICAL								CORE DRILL CREWS		Total Geophysical and Core Drill	
	Seismic		Gravity		Magnetometer		Total Geophysical					
STATE	1953	1952	1953	1952	1953	1952	1953	1952	1953	1952	1953	1952
Alabama	8	11	1	1	0	0	9	12	8	5	17	17
Arkansas	3	3	2	0	1	0	6	3	1	0	7	3
California	18	24	4	7	0	0	22	31	0	0	22	31
Colorado	22	14	3	2	0	1	25	17	1	0	26	17
Florida	9	13	0	0	0	0	9	13	2	2	11	15
Georgia	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	1	7	1	1	1	0	3	8	2	1	5	9
Indiana	0	0	0	0	0	0	0	0	2	0	2	0
Kansas	12	7	1	1	0	0	13	8	3	3	16	11
Louisiana	97	86	18	17	0	0	115	103	0	1	115	104
N. Louisiana	7	14	0	1	0	0	7	15	0	1	7	16
S. Louisiana	90	72	18	16	0	0	108	88	0	0	108	88
Michigan	2	2	8	5	0	0	10	7	3	2	13	9
Mississippi	22	15	1	3	0	0	23	18	0	0	23	18
Montana	59	59	7	10	0	0	66	69	0	0	66	69
Nebraska	3	12	0	0	0	0	3	12	0	0	3	12
Nevada	2	3	1	1	0	0	3	4	2	0	5	4
New Mexico	51	42	6	5	0	0	57	47	1	0	58	47
North Dakota	30	48	0	0	0	0	30	48	0	0	30	48
Oklahoma	31	30	0	1	0	0	31	31	0	0	31	31
South Dakota	7	6	0	0	0	0	7	6	0	0	7	6
Texas	198	205	33	23	2	1	233	229	7	5	240	234
East Texas	25	29	4	2	2	1	31	32	1	2	32	34
North Texas	14	21	2	2	0	0	16	23	1	1	17	24
Southeast Texas	55	49	6	2	0	0	61	51	0	1	61	52
Southwest Texas	36	37	6	3	0	0	42	40	1	0	43	40
West Cent. Tex.	4	4	2	1	0	0	6	5	4	1	10	6
West Texas	64	65	13	13	0	0	77	78	0	0	77	78
Utah	7	9	2	1	0	0	9	10	3	0	12	10
Wyoming	38	44	4	2	0	0	42	46	0	0	42	46
Total	620	640	92	80	4	2	716	722	35	19	751	741

Prospecting Outlook . . . Midland-Upton Basin, Rocky Mountain regions to get more attention. Coastal areas to be active.

High degree of wildcatting successes in the Midland-Upton Basin during 1953 points to continued development in that trend during 1954.

No other part of West Texas enjoyed as successful a year from an oil reservoir standpoint, and every indication is that much of the exploratory effort of this year will be concentrated in that area.

Pre-Permian discoveries, particularly of Devonian and Ellenburger age, turned attention to the Midland-Upton Basin back in 1951 before the vast Spraberry Trend, lying in the same basin, became a disappointment.

There followed important discoveries in 1952 with impetus added through increased development in 1953, particularly in Andrews and Midland Counties.

The high regard in which Andrews County, one of West Texas' older producing counties, is held, was reflected at the Dec. 11, 1953, auction of leases on University of Texas land. More than half of the 146 tracts—80—were located in Andrews.

Rather than in drilling blocks, as is customary when high prices are paid for University acreage, those at the December 1953 sale were in individual tracts, bringing per acre prices that ranged upward to $2,640 per acre that the Gulf Oil Corporation paid for 161.03 acres south of its Triple N Ellenburger pool, one of its 1952 discoveries.

This spirited bidding reflected the desire for acreage in the Midland-Upton Basin and can be interpreted as a barometer as to what is to come in a drilling way for that part of West Texas this year.

Delaware Basin. While the concentration of effort of 1954 can be expected to be in the Midland-Upton basin, it will not take all of the attention. There will be continued pecking away in the Delaware Basin on the west side of West Texas, where nothing of major importance has been uncovered as yet.

However, there was some deep drilling there last year and more can be anticipated in 1954.

Permian Basin. Attention also will be directed toward the southeastern part of the Permian Basin, particularly in Runnels County, where discoveries have been numerous for the past six years. Also to be caught in the drilling campaign in this direction will be Sutton, Schleicher, Tom Green, Concho and McCulloch Counties.

The northern end of the basin also has prospects of expanded development in 1954, as does in the southwestern part and the east side.

Spraberry Trend. The Spraberry Trend, which proved a disappointment when the recovery per acre appeared to be lower than expected, also will receive some attention this year, chiefly because of improvements in recovery methods.

Also helping will be the fact that the vast trend has been returned to the statewide producing pattern after low rates of flow during the majority of 1953 which were occasioned by efforts of the Texas Railroad Commission to halt the flaring of gas.

This led to a shutdown of the field, then the re-opening by a court decision and a flow restricted to the gas outlet for the field. The latter was remedied with the completion of the El Paso Natural Gas Company and Permian Pipe Line Company's system out of the area.

Development in 1953 ranged from the discovery of oil at 772 feet in Irion County at Jones & Lyons Fields 1, a San Andres discovery, to the Sun Oil Company Mitchell 1-X, gas discovery at 13,750 feet in extreme southwestern Crockett County.

Regardless of the developments elsewhere, attention continually is drawn back to the Midland-Upton Basin, where the lower Permian, Devonian and Ellenburger discoveries in Andrews County cut the pattern of what can be expected in 1954.

A rundown of a few of the deeper discoveries shows the C Ranch Devonian, Northeast Midland Farms Ellenburger, Hutex Devonian, Lowe Silurian, Magutex Devonian, Northeast Andrews Ellengurger, Wemac Wolfcamp, Midland Farms Fusselman, Prichard Devonian, South Andrews Devonian, Andrews Wolfcamp, Black 9 Wolfcamp, Parker Wolfcamp, East Block 12 Ellenburger, South Andrews Wolfcamp, Emma Ellenburger, Glasco Devonian, Fasken Ellenburger, Prichard Ellenburger pools were opened in Andrews County last year.

New Mexico Discoveries Indicate Active Year

Discoveries of 1953 give every indication of a continued high rate of development during 1954 in New Mexico.

Two discoveries in the Delaware Basin in Eddy County that could lead to a drilling program are those of Richardson & Bass from the Delaware sand. The two areas are 11 miles apart and drilling is planned in the gap in an effort to prove or disprove the possibility the two might be producing from a common reservoir.

On the northeast is the Richardson & Bass George H. Cobb-Federal 1, a 215-barrel well in the 7000-foot horizon, while 11 miles to the southwest is the Fidel-Federal 1, which

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made 175 barrels from 6890 to 6950 feet.

Both were deep operations, with the Cobb-Federal 1 being carried to the granite at 16,459 feet before being plugged back. This made it the deepest test ever drilled in New Mexico.

While possibilities exist from these two wells that a major reservoir may be in the making, Lea County received discoveries during 1953 already pointing in this direction.

Perhaps the most important is the Anderson Ranch pool in southwestern Lea, where production already has been proved from the Wolfcamp and Devonian.

First production was from the Devonian at Continental Oil Company et al Anderson Ranch Unit 1, a 1968-barrel well in the 13,400-foot level.

Southwestern Lea also received a Devonian discovery in the Western Natural Gas Company et al Millard Eidson 1, with development continuing there as well as in the Townsend Wolfcamp pool four miles northwest.

Deep Gas Pays Holding Spotlight in Panhandle

Gas production from deeper horizons than the pay of the Panhandle and Hugoton fields will lead to further exploration to these zones during 1954.

Attention at the start of the year was on Hansford County, adjoining Oklahoma and where just over the line in Texas County oil production was developed in the same zone that has brought new gas reservoirs to the Texas portion of the Panhandle.

The well across the line in Oklahoma that found the oil in a Morrow sand was The Texas Company's Flowers-Johnson-Eldridge Unit 1, which averaged 22 barrels per hour on a test in the 6800-foot level.

To the south and southeast in Hansford County, Texas, gas has been found in this formation at two discoveries ten miles apart—east and west.

On the east side of the county, Texaco's J. T. Blakemore 1 was estimated good for 6,850,000 cubic feet of gas per day in the 7300-foot level, while ten miles west, Humble Oil & Refining Company's Jackson 1 was showing for a good gas producer from both the Douglas and Morrow sands.

North Texas Concentrates On Older Producing Areas

Pattern of the past several years probably will be duplicated during 1954's drilling in North Texas.

This is development in the older producing counties, which enjoyed a highly successful year in 1953 from a discovery standpoint.

The discoveries, mostly in Pennsylvanian formations, extended westward from the west half of Grayson County through Cooke, Montague, Clay, Wichita, Wilbarger, Archer, Baylor and Knox counties and extend south into Young, Jack, Wise and Denton counties.

Featuring the discoveries were new pools in the Strawn sand series, particularly in Clay, Jack and Young counties.

Grayson continues to increase in importance in the North Texas picture, with Sherman, where there is townsite development, getting an Oil Creek discovery in the Standard Oil Company of Texas H. L. Rising 7, completed for 240 barrels daily at 9600 feet.

West Central Texas Activity Due to Remain High in '54

West Central Texas counties, annually one of the state's biggest wildcatting areas, will continue to be so in 1954.

The wildcat development will range from Brown and Comanche on the southeast through Coleman, Callahan, Eastland, Taylor and to Stonewall, Haskell and Throckmorton on the northwest. None of the counties in the district is expected to escape the activity.

Nolan County, taking a more prominent part in the area's development with each succeeding year, had one of the better discoveries of 1953. This was the White Flat pool in the extreme northeastern part of the county, where seven separate pay horizons were discovered. Among them were the Wilberns dolomite and Hickory sand horizons of the Cambrian.

Other areas opened in 1953 which are continuing to receive attention in Nolan are North Dora, North Favor, West Lake Trammell, Divide, Maryneal, Group, North Blackwell, and Hat Top Mountain.

However, these discoveries could not match numerically those of Haskell, Stonewall and Fisher counties, where development in the Pennsylvanian and deeper formations is expected to continue in 1954.

Development in the deeper horizons led to the discovery of the Calham area in Taylor County, one of the area's better pools of 1953.

East Texas Field Flanks To Be Explored Further

Flanks of the East Texas field, which proved productive during 1953, will come in for further probing with the bit during 1954.

Considerable of the further drilling will stem from the discovery of the Wright Mountain pool, a Pettit area three miles west of production in Smith County.

The discovery was the Humble Oil & Refining Company Hubbard Timms 1, completed for 197.34 barrels of 41.6 gravity oil daily through perforations from 8015 to 8024 feet and 8028 to 8032 feet.

Another pool bringing the East Texas flanks into the foreground was a Pettit and Travis Peak oil discovery on the northwest end of the East Texas field four miles southwest of Jamestown in Upshur County.

This was the Crescent Drilling Company and Robert Cargill Mrs. R. J. Mackey 1, completed from the Pettit for 133 barrels of oil daily at 7757 to 7763 feet, and the Travis Peak at 7795 to 7806 feet for 181 barrels per day.

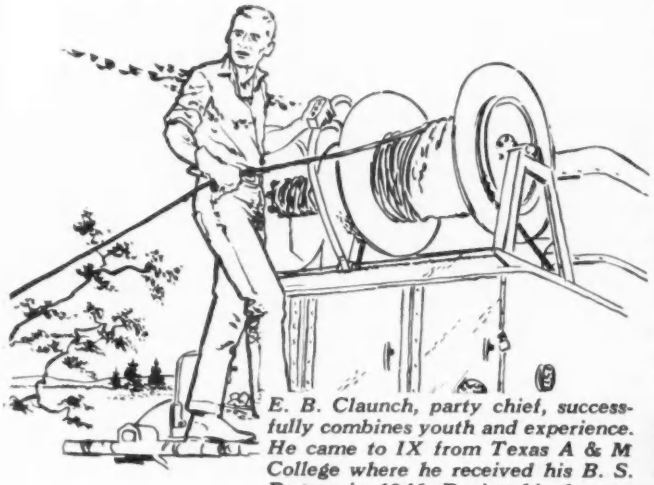
Probably the most important discovery of 1953 in East Texas was the Neches Woodbine pool of Anderson County, which was spread one and a half miles southeast into Cherokee County early in 1954. Humble opened the pool at its Northeast Neches Unit 1, a 139.8-barrel well from 4704 to 4710 feet.

Rapid development of the area was under way at the start of the new year.

Drilling in South Texas Should Remain Active

South Texas (Districts 1, 2 and 4) should continue an active drilling program in 1954.

Certain to see an active drilling program is the Gulf of Mexico, in the once-disputed tidelands, where a record-breaking $32 million was paid for leases off the Texas shoreline late in 1953. Gulf Oil Corporation, which



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paid $3 million for a 5760-acre block five miles east of Mustang Island and about eight miles southeast of Mustang Island Field, apparently will be first to inaugurate a drilling program in the Gulf. Permit to drill a wildcat in Tract 774 had been asked of U. S. Corps of Engineers, although company officials indicated that actual work would not commence until mid-year. No activity has been seen in the tidelands off the Texas coast south of Galveston.

From a geological standpoint, possibility of further Wilcox exploration in Webb and Zapata counties offered the most interesting development for District 4. Standard Oil Company of Texas opened Wilcox production in Zapata County with a couple of minor gas discoveries in 1952, and at end of 1953, Skelly Oil Company was assured of gas production from that zone at its wildcat in southeastern Webb County near Aguilares.

Frio gas discoveries along the Rio Grande were expected to add impetus to exploration in 1954, provided that the confusion existent since passage of the Natural Gas Act is cleared up. Hidalgo County on the border remained in the limelight, with new pay zones added to the Tabasco and San Salvador fields, and with discovery of a new reservoir by Union Producing Company at the San Carlos Field, northeast of Edinburg.

District 2 had a major multi-pay oil and gas reservoir opened during the year at Mary Ellen O'Connor Field in Refugio County, discovered jointly by Humble Oil & Refining Company and The Chicago Corporation. Development of this reservoir is expected to keep the county's activity at a high gear during 1954. Victoria and Goliad counties are expected to continue as pace setters from the standpoint of activity this year in District 2, although neither could boast of an outstanding discovery during 1953.

Shallow pay wildcats probably will continue to be the interesting feature in District 1, where several shallow fields were opened during past year, significance of which cannot be determined until further development. The Cooksey Field of Bexar County saw its first concentrated drilling program by a major operator when Plymouth Oil Company started development of its Anoil lease.

Continued Fast Pace Due on Texas Gulf Coast

Successive monthly cuts in the Texas oil allowables curtailed to a certain extent the drilling activity in the Texas Upper Gulf Coast area; however, a rapid pace of wildcatting continues and several new producing areas were opened along with extensions and new pay horizons for proved areas.

The lower coastal area of Brazoria, Wharton, Matagorda and Galveston counties was extensively explored with deep wildcats and the upper area of Jasper, Montgomery, Newton, Tyler and Polk counties was the site for many shallow explorations and numerous attempts which were carried deeper than normal for the area. All indications are that the drilling pace will continue at a fast clip to find new production in the Frio, Yegua and Wilcox zones.

Harris County was again one of the most active counties for the area with the northern portion and the southeastern part getting extensive play. Both the Tomball and the Humble domes received wide play on the south, southeast and southwest flanks and as a result two new gas-condensate pays were found in the Yegua on the southeast flank of the Humble Dome and on the Southeast side of Tomball gas-condensate pay was found in the First Cockfield Series.

Sinclair Oil & Gas Company opened the Bender Field in Montgomery County at its Bender Estate A-1 (formerly No. 1) proving to be the most prolific find for the area during 1953. The discovery well found oil pay in the Yegua at 6000 feet and was followed by extensive development which uncovered gas-condensate pay and oil pay in the 5700-foot Yegua zone. Indications are that this area will be linked with the Kuhlman Field of Harris County. Still adding to the luster of this new area was Harrell Oil Company's 5800-foot Yegua oil discovery a mile Northeast of the Kuhlman Field and just south of the Montgomery County line in Harris County.

Colorado County development continued at the Cecil Noble Field as production was pushed westerly within the city limits of Columbus townsite, finding two new and deeper oil pays in the Wilcox. Gulf Coast operators continued development at the South Hampton Area, one of 1952's major discoveries, finding two new 7800-foot oil sands in the Yegua series.

Brazoria-Tyler. Along with the wildcatting play for new discoveries, operators entered old producing areas in Brazoria and Tyler counties and re-discovered two previously abandoned fields. The Bailey's Prairie area of Brazoria County was re-opened by finding gas production in the Frio at 10,700 feet, while over in Tyler County, Shell Oil Company re-opened the Wurtsbaugh sector by producing gas-distillate from 9100 feet in the Wilcox. Both of these areas were followed by successive tests which found oil in the 11,100 foot Frio zone at Bailey's Prairie and in the 9000 foot Wilcox pay at Wurtsbaugh.

The trend, which was predicted years ago by geologists and which was started actively last year, of drilling deeper on the flanks of the old salt domes was continued during 1953. Virtually every known dome on the Texas Gulf Coast received at least one location but the Big Hill Area and the Spindletop Dome in Jefferson County rated priority. Operators' efforts at these two areas uncovered four new oil zones in the Miocene, Yegua and Frio at Spindletop and six new oil zones in the Frio and one new gas pay in the Marginulina at Big Hill.

Orange County production was extended Northward and opened new oil pays in the Frio and the westerly and northerly sides of the North Dayton area of Liberty County found new oil sands in the Miocene, Basal Miocene and Frio. Sun Oil Company actively drilled at Caplen in Galveston County and their efforts payed off in six new oil-bearing sands in the Yegua.

Coastal Louisiana Due For Its Biggest Year

Coastal Louisiana, extending northward from the Gulf of Mexico to the fringe area including Rapides, Avoyelles and Vernon parishes, will see perhaps the most active drilling program since oil was first discovered in the region at Jennings more than 50 years ago.

Basis for this forecast is a tidelands drilling area along with continued development of the Cockfield pools opened in Beauregard Parish last year, the deep drilling off domal

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flanks, and continued seismographic work on state-owned and offshore water bottoms, extending as far as 25 miles from shore line.

Drilling for new reserves ranged from 500 to 17,600 feet during 1953. Shell Oil Company completed the world's deepest producing oil well at Weeks Island in Iberia Parish. This was surpassed late in the year by The Ohio Oil Company's KCL "A" 72-4 in Paloma Field, Kern County, California.

First oil and gas production was opened in St. Bernard Parish in the Lake Borgne area and to close out the year Phillips Petroleum Company opened a multi-pay field in the Eloi Bay of Chandeleur Sound which flows oil and gas from 6000 and 7000 feet.

Drilling Steady. On the lower reaches of the Mississippi River, Humble, The California Company, Shell Oil Company and The Texas Company maintained a steady drilling program in the Main Pass and South Pass areas, completing more than 200 wells during the year in offshore areas.

A prolific oil and gas field was opened in the West Delta area of Plaquemines Parish by Continental Oil Company. Three producers have been drilled and completed in as many pays. Other zones tested oil or gas, but were shut off.

Cities Service and Forest Oil Corporation opened a major gas pool in the Bourg area of Terrebonne Parish, producing from the Khrumbah zone of the Miocene sandstone below 12,000 feet.

Gas Discovery. The finding of a big gas reservoir in the Southeast Grand Chenier area of Cameron Parish was credited to Forest Oil Corporation. Although completion was not made at the first operation on Dr. M. O. Miller lands, the well cored in excess of 150 feet of gas and condensate pay before blowing wild from 13,300 feet. A second test has been started to further evaluate the area.

The Ohio Oil Company opened a second pay zone 600 feet deeper than regular field pay at Phoenix Lake in Calcasieu Parish, adding more prestige to the pool which extends into Texas near Orange.

A new Frio oil field was opened two miles south of Baton Rouge in East Baton Rouge Parish. Two wells have been completed by The Atlantic Refining Company each flowing from separate reservoirs.

Good Year Forecast For Northern Louisiana

Due in part to widely scattered and highly different sources of interest, another good year is forecast for drilling in North Louisiana. While a decrease is expected throughout the Wilcox parishes, interest is expected to rise in deeper beds in the more northern areas.

Important wildcats are slated during early months of 1954 and much development is yet to be done in existing fields. Numerous new pays were discovered in old fields last year and many of them will be exploited. Colquitt field of Claiborne Parish, discovered late in 1953, is scheduled for development.

Drilling programs in Pine Island Field of Caddo Parish, northwestern Louisiana, were given new life by response of producing zones to fracture treatment. Production in the old field is now desired not only due to its shallow depth, but also to indicated capacity. New life is graphically displayed by the number of new wells started in the field during last half of 1953. Total of 408 sites were selected during this period compared with 166 staked during first six months of the year.

Existing fields are expected to bear the brunt of North Louisiana's 1954 drilling unless discoveries materialize. Much work is yet to be done in developing Cotton Valley sands in fields of Bossier, Caddo, Lincoln, and Webster. Smackover Lime will be chief target of wells in Claiborne and Union parishes.

Wilcox Oil. While dropping below level of former years, considerable attention will be paid to development and discovery of Wilcox oil in parishes of central and east-central Louisiana.

Activity in Arkansas May Lag Behind 1953

Arkansas is expected to remain fairly active during 1954, although it will possibly drop below the level of drilling enjoyed during 1953. Lease buying was exceptionally active in 1943 and 1944, due to changing conditions of World War II and a subsequent increase in the consumption of petroleum and products. These leases are now either held by production, expired, or are expiring. This fact became more evidently appreciated during latter part of 1953 as some of the larger companies began ordering lists of mineral owners in areas that they still consider prospective.

New ownership maps have been completed recently on Miller, Lafayette, Columbia, and Union counties. Distinctive feature of the past decade was the intensity of exploration and development or liquidation of most localities with promise. However, that liquidation is not as complete as it would appear as many oil fields discovered today are pin-pointed by the dry holes that surround them.

Drilling program in South Arkansas will be devoted largely to the search for oil in Upper and Lower Cretaceous sediments along faults and in graben areas. While there no longer remains fields the size of Smackover and Magnolia, many areas capable of supporting five to 20 wells still exist.

Exploratory programs in central and west-central counties of Arkansas are due to continue, while drilling is also expected to materialize in east-central part of the state. Preliminary exploration was heavy in east-central Arkansas during 1953 with operators expending much effort with gravitymeter, magnetometer, seismograph, and core-drill.

Mississippi Anticipates An Increase in Activity

With several factors contributing, an over-all increase is expected in Mississippi activity during 1954. More or less successful completion of six wildcats in northeastern Mississippi in 1953 will lead to expansion of exploratory drilling in the Paleozoic area of the state. Discovery of Rodessa Oil at Soso in Jones and Jasper counties enhances further deep prospecting on existing and producing structures.

Development of gas and condensate reservoirs in the Pistol Ridge-Maxie field areas of Forrest County adds further incentive in southern and southeastern portions. Wilcox work will continue in Adams, Franklin, Jefferson and Wilkinson counties in southwestern corner of Mississippi, largely responding to work of independents.

Area of Interest. Under impetus of discoveries in northeast Mississippi, plus volumes of undeveloped acreage, operators did considerable geophysical work in this area during 1953 in

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addition to drilling 22 wildcats. Of the six successful wells, five locations are attributed to the work of seismograph, therefore, perhaps, establishing a basis for preliminary work in this sector.

Extension of leasing and preliminary exploration programs during 1953 is expected to be followed by an extension of exploratory work during 1954 and coming years. Discovery of oil in Knox Dolomite in Monroe County, added more heat to an already intense interest in the Black Warrior Basin area of Northeast Mississippi during 1953.

Additional deep drilling is expected in fields in southern Mississippi as a result of Gulf Refining Company's discovery of Rodessa oil at Soso.

Western Oklahoma Pins Hope on Anadarko Basin

A renewed exploration program for production in the Anadarko Basin of Western Oklahoma is expected to be the feature of Oklahoma oil activity in 1954.

Assurance given by geologists that sedimentary columns extending 30,000 feet in thickness exist in portions of the basin and with the known presence of source beds in the sedimentary column, the basin is expected to draw many deep wildcat tests in 1954.

The imbalance of supply and demand for crude oil which occurred shortly after the middle of the year is believed to have delayed activity in the basin.

There is little or no relinquishing of acreage in the counties comprising the basin and expiration date on some of the acreage taken at the time of the Elk City field discovery is likely to bring some important wildcats in 1954.

The Pennsylvanian is the most commonly tested section. In one section, the Pennsylvanian was not based at a depth of more than 15,000 feet.

Chances Good. This could indicate the columnar depth of formations below that depth which may offer rich finds and reserves greater than any known in Oklahoma.

Opening of Arbuckle lime production in northwestern Woods County close to the Kansas line by the Champlin Refining Company was the only significant discovery in 1953.

Old Areas Revived. Success of formation fracturing stimulated exploration in many old areas in the eastern half of Oklahoma and also spurred renewed activity of water-flooding in areas heretofore believed depleted and without value for secondary recovery operations.

Tulsa, Washington, Creek, Rogers, Nowata, and Okfuskee counties particularly have benefited by the redrilling program with intent of formation fracturing.

Logs of old wells have been studied and old holes in good condition have been re-entered and re-tested with the benefit of the new production technique.

The area between Tulsa and Jenks, in Tulsa and Creek counties, in the vicinity of Oologah, Owasso, and Collinsville received numerous small discoveries in the last half of 1953 with wells rating production as high as 50 to 75 barrels daily.

Re-drilling in Kansas' Hugoton Area Indicated

Opening of a new and deeper pay in Seward County, in the Kansas portion of the big Hugoton gas field by the Cities Service Oil Company is expected to be the highlight of exploration for last year.

Cities Service opened the Topeka limestone, approximately 1500 feet deeper than the regular Hugoton pay, to prolific gas production with its Forester 1, 28-33s-11w, which remained uncompleted as the year closed.

Inasmuch as the Topeka lime is considered a "blanketing" formation in much of Kansas, the Cities Service discovery in Hugoton may indicate a widespread re-drilling program for the big Hugoton area.

It is expected to prevail particularly in the older portions of the field which may show a decline in volume of production over the years since discovery.

Deeper Tests. The discovery also may stimulate deeper tests to the basement rocks with the hope that some oil producing zone may be found at the greater depths.

Drastically curtailed production during the last quarter of the year made itself felt on the rate of exploration, but with this condition remedied in 1954, Kansas is expected to benefit with other states in increased exploration.

Discovery of oil in Barber County, just north of the opening of Arbuckle production in Woods County, Okla., may develop into a two-state play in 1954.

The Barber County discovery was from the Mississippi lime and with deeper production to the south in Oklahoma, exploration of the Ordovician age formations may be expected to be extensive.

Formation fracturing has made itself felt in exploration in Kansas particularly in the older fields in the eastern part of the state. This production technique also is being experimented with extensively in water-flooding operations.

Water-flooding Upsurge Sweeps Tri-State Area

The year 1954 looks profitable in the Tri-State Basin area of Illinois, Indiana, and Kentucky with extensive water-flooding, sensational success of deeper drilling possibilities, and new discoveries on the outer edges of the basin in prospect.

The discovery of 60 new pools in the basin area highlighted 1953 activity. The longest "step-out" discovery was in August—the Florissant Pool, in St. Louis County, Mo., more than 21 miles from other production. Twenty wells have been completed at the year's end, averaging 35 barrels a day and eight dusters dug to date in this new Trenton 1050-foot small pool that is seven miles northwest of Lambert Airfield in the suburbs of St. Louis.

Extensive water-flooding projects are in the planning or working stage in most of the fields and the new process of fracturing is sensational in some instances.

Other discoveries in the past year that will play an important part in the pipe line runs during 1954 is the increased activity in Perry, Spencer, Dubois, and Crawford counties, Indiana. Most of this area has always been considered as a low oil recovery area but due to the discovery by Joe Simpkins of a Tar Springs sand pool at 950 feet, three miles north of Rockport in Spencer County; J. Millard Haynes' Salem discovery in Perry County, more than six miles from other oil wells; and several new pools

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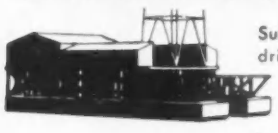

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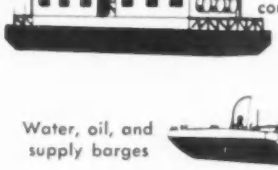

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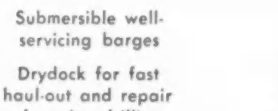

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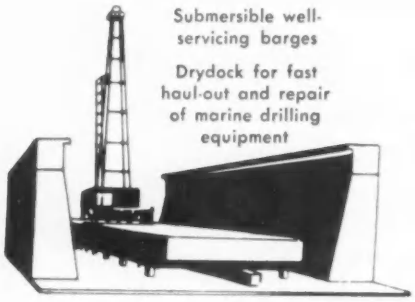

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developed last year in Dubois County, Indiana, new exploration interest has been aroused all over a five county "little man's" shallow play area.

Water-flooding is now an important factor in the production for this area. More than 150 projects are "cooking" for '54. About 20 percent —234,300 oil a day produced in the Tri-State—is coming from secondary recovery and recently fractured wells.

Other prospects for 1954 are the drilling of deeper pays in the already proven areas. The Devonian for the past year has been rather prolific with new discoveries in Sullivan and Vigo counties, Indiana, around Terre Haute; around Bowling Green, Ky., where 30,000 acres were proven commercial, and a small new Devonian pool was discovered between Princeton and Mt. Carmel in Gibson County, Indiana.

Jackpot in Kentucky. Kentucky continues to get "jackpot wells." The most recent was the Magnolia's discovery near Smith Mills in Henderson County.

Outlook in Michigan Brightest Since 1949

A shallow drilling play in an almost overlooked area bloomed at year's end and in combination with planned development should give Michigan one of its best years since 1949.

The shallow play was kicked off in December when W. C. Taggart's Curtiss 3, W½ SW SW 28-4s-4e, Washtenaw County, produced 400 barrels 36 gravity oil under choke from Traverse limestone at 1030 feet. In an area given little attention in the past, the strike already has attracted 13 rigs, active leasing by independents and major companies.

Other late year developments added to the brighter forecast for Michigan in 1954. Top interest is centered on deeper Richfield formation production, which accounted for a high percentage of the 1953 oil well completions in both new and old districts.

Don Rayburn's Meyer 1, N½ NE SE 25-20n-3w, Clare County, completed at 5269 feet, the discovery, is producing over 100 barrels oil per day, and first offset completion, Frier 1, N½ SW NE 25-20n-3w, flowed 80 barrels per hour after a 5000-gallon acid treatment in the Richfield at depth of 5100 feet. Cores showed 26 feet of pay section.

The Frier well on the basis of the after-acid production is the best Richfield well ever completed in Michigan and compares with the production of Dundee and Monroe fields, long the backbone of Michigan's oil industry.

Rayburn development, near the village of Skeels, will influence a major drilling campaign and encourage further Richfield exploratory work.

Pure Oil Company established Richfield production on the Gingrich 1, SE SE SW 30-18n-10w, early in January, 1954, first commercial production from the horizon in the old Reed City field, initially developed in 1940 for Dundee and Monroe production.

Reed City in its initial development accounted for over 200 commercial wells and covered over 5300 acres. From the 3600-foot Monroe section it has produced about 7500 barrels per drilled acre.

Fewer Tests, But Hopes Remain High in Ohio

Although the total number of rigs operating in Ohio increased during the past year, the number of wildcat tests decreased but the results of these tests offered encouragement for the coming year.

In the Lake area, the search for gas is expected to continue after indications of two pools, one probable reef production and the other Silurian. In the extreme northwest area, present leasing activity should result in several tests, again for the possibility of reef production.

The east and southeast areas are still attracting considerable attention and although results so far have not been encouraging, several more tests will be put down. Large areas in the south-central part of the state are being leased.

Rocky Mountain Area Looking for Big Year

Oil operators of the Rocky Mountains are expecting another record year after having completed the year of greatest activity in the history of the region. Drilling, wildcat discoveries, production and exploration increased last year and further increase in activity is expected.

Reasons Are Varied. Principal factor

in the production increase and also to less extent in the exploratory activities, was additional outlet for both crude and refined products from the region. Completion of the Platte pipe line from northwestern Wyoming to Wood River, with a capacity of 105,000 barrels of oil daily, increased production through the region by exactly that amount.

This and other outlets accounted for added production from the region from a record 113 million barrels in 1952 to more than 150 million barrels. Development drilling increased accordingly to meet this current demand. Products line expansion also extend markets and added additional demand on crude locally refined.

Wildcat drilling has been increasing in the Rocky Mountains for several years, and the rapid movement of new operators to the region, with their resulting discoveries, has assured the region of a continuing exploratory program. This is evidenced by larger budgets by both major operators and independents.

Widespread exploration throughout the 11-state Rocky Mountain area during 1953 is expected to continue. New areas of interest may be expected to attract additional activity. During late 1953 there was increased interest in western Colorado and eastern Utah. This area undoubtedly will have considerably more wildcat drilling during 1954.

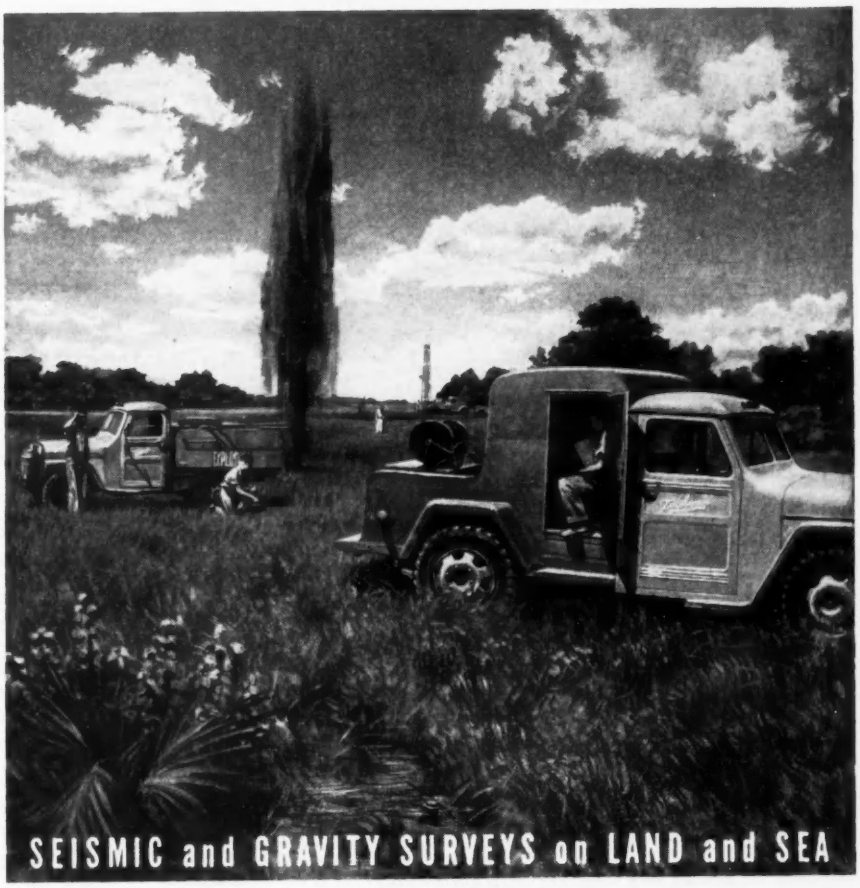
Geologic thinking has been a major factor in the renewed interest in the Rocky Mountains. Areas considered of little value, such as the San Juan basin where there was small gas production until new studies were made and production practices used, attracted little attention until recently. Drilling in the Williston Basin had given little encouragement until new geophysical studies indicated increased possibilities. This new thinking, combined with more modern methods of search, will continue to be responsible for discovery of sizable reserves in this region.

• WYOMING

Until recent years stratigraphic traps have been considered responsible for only a small amount of the Rocky Mountain reserves. In Wyoming a few fields such as Mush Creek, Skull Creek, and Fiddler Creek were the result of Cretaceous sand lensing and developing along trends on the east side of the Powder River basin. However, during 1953 a producing trend was developed over 20 miles southwest of previous production through Clareton and to the south line of Weston County. More than 50 rigs, over half of those active in the state, moved to the area and undoubtedly will be kept busy during 1954 in development and further extension of this producing trend. Additional wildcat drilling along the flanks of the basin will undoubtedly account for a large part of the exploratory drilling.

The west and south sides of the Powder River basin were also active with both wildcat and development drilling, making 1953 discoveries in the general Sussex area, the Glenrock area, where sand development apparently controls oil accumulation. During 1954 a large part of the exploratory work will continue in these areas.

However, deeper basin drilling will also aid in maintaining Wyoming as the largest producing, and most ac-



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tive state in the Rockies. A well in the deeper portion of the basin at year's end indicated commericial recovery from Shannon sand and successful completion will undoubtedly increase the deep basin drilling in the Powder River, largest producing basin of the region.

The Big Horn basin in the northwestern part of Wyoming was also very active in 1953 and indicated a more active coming year. Discovery of oil in the Manderson area, Big Horn County, accounted for a part of the activity, and indication of a very sizable reserve in the Phosphoria zone along a sizable portion of the east flank of the basin will call for an expanded drilling program through this area. Several discoveries were made in the general area during 1953.

Deep basin drilling has been active in the Big Horn area since discovery of oil at deeper zones in the Worland field several years ago.

The south and west sides of this basin also have been of interest in this, the second-most active area of the state. However, a factor that may slow flank wildcat and development drilling in this basin is black, low-gravity oil generally found in Pennsylvanian and Mississippian beds. Market for this crude has slowed during recent months and production may lag during 1954.

The most interesting basin from a future reserve standpoint in Wyoming is the Green River covering the southwest third of the state. With the press for oil along pipe lines through the central part of the state there has been little interest in the gas-bearing Tertiary and upper Cretaceous zones of this basin.

During 1953 the most active leasing in the region was for lands in this basin, as new outlet for gas was indicated in application for a gas line from the San Juan basin of-Colorado-northwestern New Mexico, through the Green River to the Pacific Northwest. There was a sizable geophysical program underway in 1953 through the basin, and several wildcats are underway, testing primarily Mesaverde zones. Important gas reserves were developed in 1953 in the general Big Piney area, along the west side of the basin, and the northwest portion of the basin will have new drilling during 1954.

• MONTANA—THE DAKOTAS

The year 1954 should see one of the most active wildcat drilling programs in history for the Williston basin. There are several reasons. Study is now underway for a pipe line outlet from the region into the midwest refining centers. At present all oil from the Williston basin is moved by trucks and tank cars, at high cost. An outlet, other than that completed but not yet in use from the Nesson anticline fields to Indiana Standard's Mandan, N. D., refinery, is necessary before development drilling can reach normal balance with wildcat drilling. Discoveries made during 1953 moved this basin from an unknown phase with production established only on previously known surface highs to a status where geophysical methods were determining subsurface structure.

Discoveries at Brorson, between the Nesson anticline in North Dakota and the Cedar Creek anticline in Montana, were the result of seismic surveys. In North Dakota Amerada Petroleum Company's Fryburg dis-

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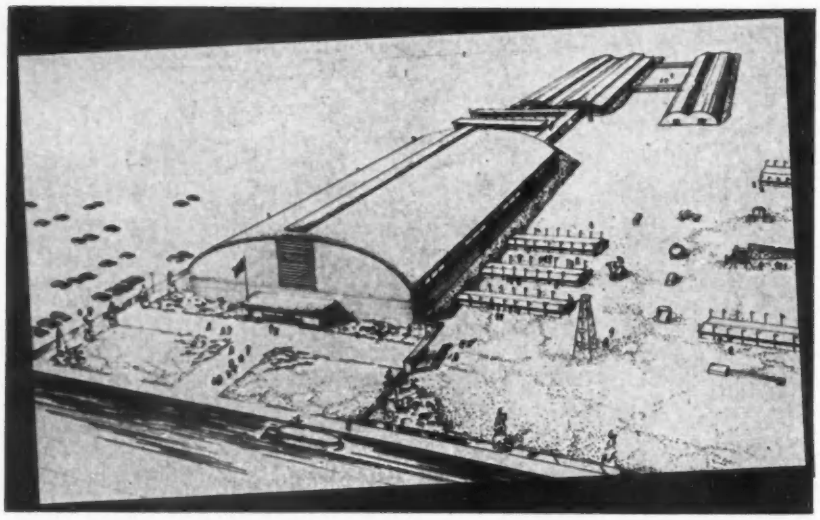

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covery was the first in that state away from the Nesson structure. At the end of 1953 there were two additional discoveries indicated in the state which further confirmed seismic work in the area. Stanolind Oil & Gas and others completed during the year a discovery at West Sanish, southeast of the Beaver Lodge pool, with oil from the Ordovician.

The Cabin Creek discovery by Shell Oil Company, along the Cedar Creek anticline, Montana, drew considerable attention because of the considerable probable pay section, estimated at more than 750 feet, together with estimates of high potential.

Discovery of oil by Shell Oil Company in South Dakota was evaluated as less important because the discovery is along the general Cedar Creek trend, extended south into South Dakota from Montana.

There was increased confidence in possibility of production along both the east and south flanks of the Williston basin, in eastern North Dakota and central South Dakota, as a result of discoveries in southern Manitoba. A large part of the drilling program through the Dakotas has been based on trap possibilities along the flank of the basin. New wildcat drilling will be conducted through both of these states.

Central and northwestern Montana should increase wildcat drilling during 1953, as new ideas were developed for these areas. The overthrust belt along the west side had a sizable lease play and indicated increased potentialities. There will be some wildcat tests drilled in this area, as well as along the Sweetgrass arch during 1954.

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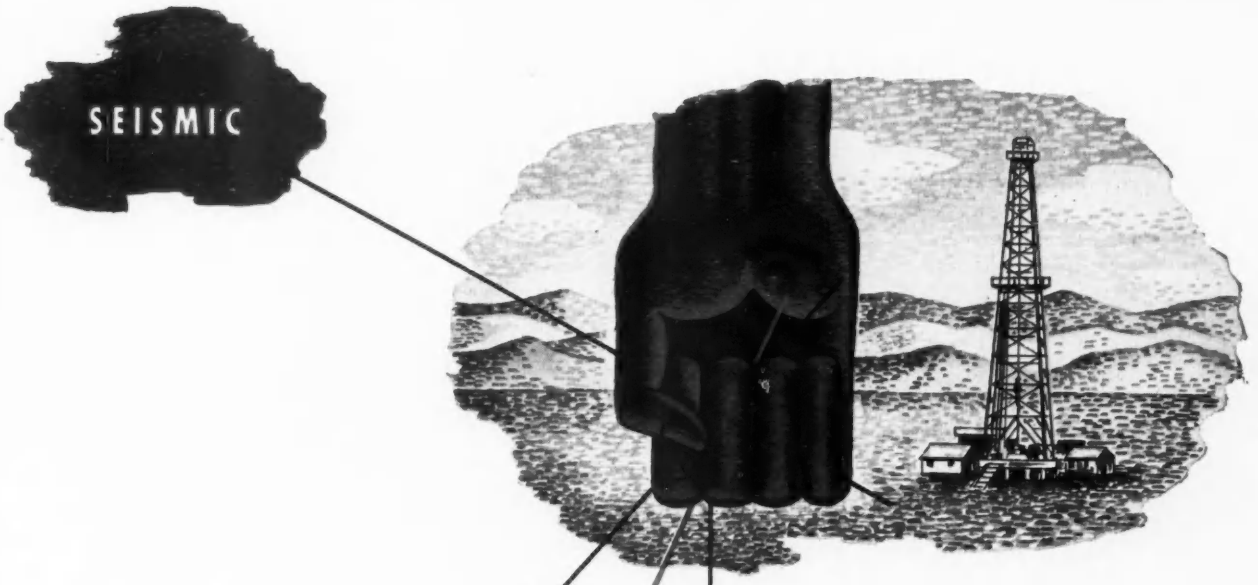
• COLORADO

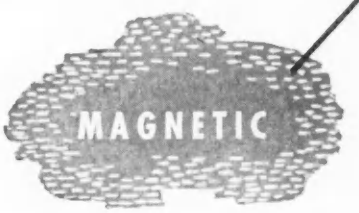
The greatest impetus for deeper drilling in the Denver-Julesburg basin was furnished in 1953 with the discovery of oil in Lyons (Permian) at two fields in Colorado. Although one, Keota, was of non-commercial classification, production at Black Hollow, Weld County, definitely has proven justification for tests to lower formations. Since discovery in the Gurley area, Nebraska, five years ago, there have been more than 175 pools found in this basin with production from Dakota sands (Cretaceous). No deeper production had been found until the Lyons discoveries.

During the coming year there will be a continuation of Cretaceous sand drilling, although probably not to the extent of activity during 1953. Deeper drilling undoubtedly will be more general throughout the basin with wells testing zones below the Permian, and trying for Pennsylvanian and Mississippian oil which zones are not presently productive in the basin. There has been comparatively little deeper drilling in this basin to the present.

Southeastern Colorado also will be active for exploratory drilling, particularly the Anadarko basin. During 1953 production was first found in this portion of the state, with an extension gas well drilled near the Morton County, Kansas, line. Three wildcats were underway at the end of the year, indicating increased interest in an area which has had little attention.

Western Colorado, as previously mentioned, will receive an increased attention for wildcat drilling during 1954 after having been semi-dormant for sometime. Following the Rangely development, where production is





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now 60,000 barrels of oil daily, there was a spree of wildcat drilling with little success. A large part of the present drilling, as in the Green River Basin of Wyoming, is due to promise of a gas outlet. The Paradox basin, where there has been practically no drilling for three years, will have increased interest to operators. The San Juan basin of Colorado will also have more activity.

• UTAH

Interest shifted in this state during 1953 following development of substantial gas reserves in the Clear Creek field, along the Wasatch plateau in the central part of the state. For six years the Uinta basin of northeastern Utah has been the most important area of the state, resulting in several discoveries. However, disappointments in production, as well as drilling costs, have resulted in lessened activity. During 1953, however, there were several important discoveries in the Uinta basin Tertiary area, and undoubtedly there will be a moderate continued wildcat and development drilling program carried on during 1954.

The Wasatch plateau activity will be increased during 1954, following processing of several blocks by major and independent operators along a large area through the central part of the state.

That southeastern Utah will increase in importance is proven by large lease bonuses paid by nearly all major operators for leases on Navajo Indian lands in 1953. Various sales brought nearly $7 million in bonus, as much as $130 per acre for some, and land surveys are now underway prior to extensive drilling.

The Paradox or Salt Basin in the east-central part of the state, semi-dormant for three years, will have renewed efforts at commercial production. Nearly all wells drilled in the area have found substantial shows but failed to maintain production on tests. New leasing in this area also indicates wildcat drilling will follow.

• NEBRASKA

The 26 Cretaceous discoveries in the Nebraska portion of the Denver-Julesburg basin during 1953 promise that there will be continued effort at Cretaceous production during the coming year. However, areas of even more interest from a possible reserve standpoint will be deeper drilling in this basin, particularly along the flanks, as well as drilling along the Chadron arch in the central portion of the state. Commercial production has not been established in this state below Cretaceous, but has been, and will continue to be the subject of continued search.

• NORTHERN NEW MEXICO

Two interesting oil discoveries were made along the southeastern flank of the San Juan Basin in 1953, one in the Entrada formation and another in Dakota sands. Both are expected to increase the interest during the coming year in deeper drilling in the San Juan.

Most of the gas discoveries in northwestern New Mexico last year were east of previous gas in the very large Blanco-LaPlata gas field. Future drilling may tie these present discoveries into production of the field proper. Without question, drilling for gas development in the San Juan will continue, probably at an increased pace if approval is given

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for a further gas outlet for the basin.

Another interesting area of the state will see increased drilling during 1954. Continental Oil Company and others have acquired sizable lease holdings in the Raton basin, in the northeastern part of the state. Continental plans a wildcat drilling program starting early in 1954, with additional wildcats planned by other operators.

• IDAHO-NEVADA-PACIFIC NORTHWEST

Several disappointing wildcats were drilled in Idaho during 1953. There appears to be a temporary lull of operations. Commercial production has not been established. Several of the larger surface geologic features have now been drilled. New geologic thinking may be required to more fully evaluate opportunities of the state.

During 1953 an exploratory program through Washington and Oregon assumed increased status and caused movement of geologic parties into this region. Several operators established offices and at the end of the year several had announced drilling plans. Activity is being watched with interest. No commercial production has been established.

Nevada exploration has been disappointing, but drilling is continuing on large lease holdings held primarily by major operators.

California's Drilling Outlook Is Bleak

DEVELOPMENT DRILLING in California for 1954 likely will show a slight decline.

For the first time in many years even the major oil companies, which normally program their wells with fair accuracy, were not sure that the schedules as outlined now would hold by the end of the year.

These uncertainties were caused by a number of factors.

As for the major companies their plans seemed to be somewhat in a state of flux because of the "absolutely horrible record" of wildcat drilling in California during 1953.

During last year there were only seven new fields discovered in California. And, none of the discoveries looks like it is going to be of major proportions or even what one might consider a large pool. This record compares with 12 new field discoveries in 1952.

The California Conservation Committee reports that the total of new discoveries made in 1953 will not develop enough reserves to offset the withdrawal of crude during the year.

Possibly the most important discoveries, geologically speaking, were the Eocene pools opened under the North Coles Levee field in Kern County and the Torry Canyon field in Ventura County.

Both of these discoveries however, were deep and from the small production developed it is doubtful yet whether either will be of commercial significance. On the other hand, the very fact that the Eocene sands were proven productive in widely scattered areas will give considerable impetus to the drilling of more wildcat wells to this sand in 1954.

From the district point of view, California also had a rather poor year. There were no new areas which seemed to show promise. Probably 1954 will see an all-out effort on the part of many companies to test the more remote areas in the hopes of adding new life to California's somewhat narrowing productive prospects.

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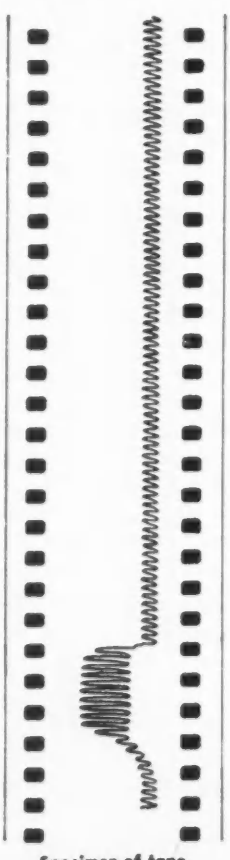

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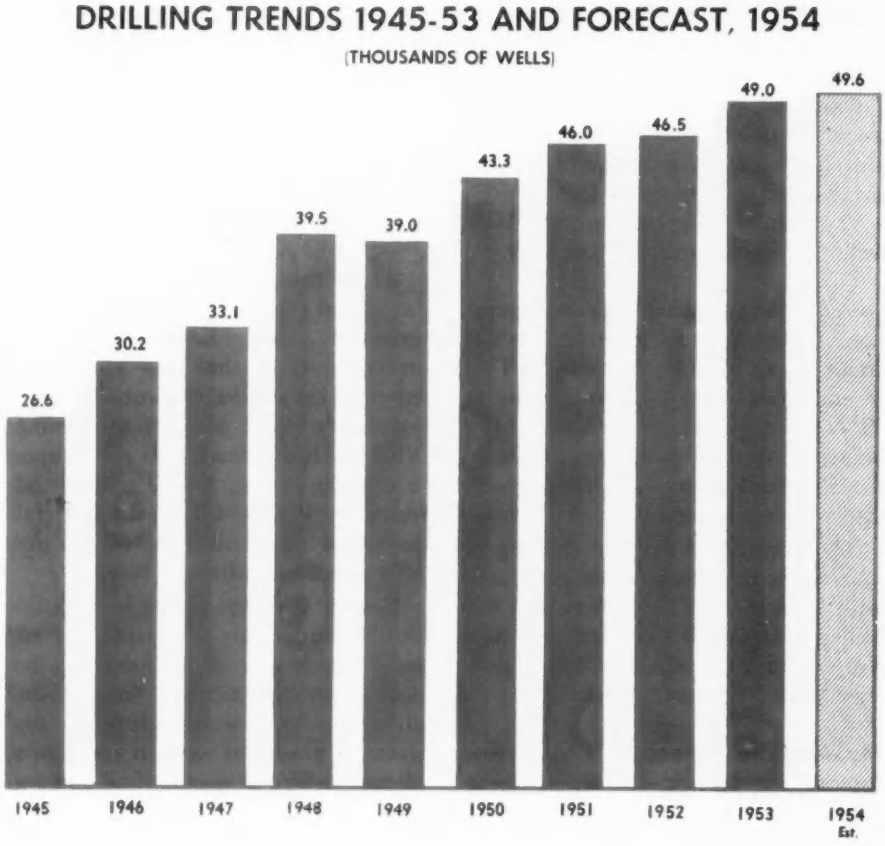


Drilling Forecast . . . Completion of 49,564 wells, a new all-time record, indicated in 1954.

By **WARREN L. BAKER,** Editor,
and **CECIL W. SMITH,** Statistical Editor

DRILLING ACTIVITY in the U. S. is expected to rise to another new all-time peak during 1954. WORLD OIL's annual forecast is for the completion of 49,564 wells in 1954, and the drilling of 206,538,650 feet of hole in completing these wells.

This prediction calls for 525 more wells and 10 million more feet of hole than during 1953. The number of wells is expected to rise only 1.1 percent, but the amount of footage will increase by 5.1 percent.

To find enough new oil to supply constantly growing consumption, wildcat drilling is expected to be pushed to another record level. WORLD OIL forecasts the completion of 11,167 wildcats tests in 1954, compared with 10,675 in 1953 and 10,241 during 1952.

Big Rate of Growth. The amount of activity forecast for 1954 represents a smaller gain in number of wells than occurred in 1953, but for footage to continue the impressive rate of growth experienced in recent years. The much larger rate of growth predicted for footage than in wells results from an anticipated drilling decrease in the shallow Eastern States and greater drilling in deeper regions.

Both wells and footage in 1954 are expected to be far ahead of all years but 1953. Drilling of 49,564 wells this year would be 3057 above the 46,507 wells completed in 1952, and 3568 greater than the number drilled in 1951. These are the only years in which drilling has topped 45,000 wells.

The predicted 206½ million feet for 1954 is 18 million above 1952, and 29¾ million greater than the 176,757,221 feet drilled in 1951. These are the only years in which drilling has exceeded 175 million feet.

Price Cut Would Retard. A possible cut in crude oil prices is the one dark cloud on the horizon. Despite record consumption, excessive refinery operations have resulted in the manufacture of too much gasoline for some months. Inventories of this product have climbed above desirable levels.

If refiners continue to disregard economic reality by failing to curtail refinery runs, surplus stocks will cause gasoline price cuts despite record consuming rates. Reductions in motor fuel prices would impose heavy pressure on crude oil prices, although crude stock and production are in good balance with demand. Any reductions in crude prices would discourage the industry from carrying out such a large drilling program.

There will be ample steel this year, even of tubular goods, to accomplish the heavy drilling program. New tubular mills placed in operation in late 1953 will make about 30,000 additional tons of tubular goods available monthly during 1954.

Increase for Texas. After two successive years of registering small decreases, drilling activity in Texas is expected to show an increase in 1954. It is estimated 17,685 wells will be completed in Texas during 1954, compared with 17,041 last year and an all-time high of 17,865 in 1951.

Texas footage is forecast at 82,377,850 feet this year, against 82,203,875 in 1953.

These figures mean Texas should drill 35.6 percent of all the wells completed in the U. S. next year, and 39.8 percent of the footage.

Increased activity is predicted for the Middle Gulf Coast, Upper Gulf Coast, East Texas, North Texas and Panhandle regions. Most active Texas

area will be North Texas, where the forecast calls for 6975 completions against 6769 in 1953. Second most active region in the state should be West Texas, where 3595 completions are forecast against 3691 during 1953.

Other Leading States. Oklahoma easily will retain its rank as the second most active state, although it is not likely to experience increased drilling. The forecast is for completion of 7255 wells in Oklahoma, compared with 7280 last year.

Kansas will remain the third most active state, although expected to drill only 4240 wells against 4451 last year.

A big increase is anticipated in Louisiana, 3170 completions being predicted for 1954 against 2733 last year. Most of the gain will take place in South Louisiana, where 1910 wells are forecast against 1485 in 1953.

More drilling also is predicted for Illinois. The forecast for 1954 is 2425 wells against 2164 last year. Highly successful use of the new rapid fracturing method and extensive waterflooding will be important factors in Illinois.

California's activity is likely to drop from 2575 wells in 1953 to 2390 this year. Lack of any significant new discoveries will be the chief factor.

Wyoming is expected to drill 1020 wells in 1954 against 887 last year.

Less Drilling in East. Drilling operations in the Eastern states are to decrease from the 1953 volume. Two recent crude price cuts amounting to 79 cents a barrel, and closing of a large number of producing wells in the Bradford area, will have a very discouraging influence.

The forecast is for the drilling of 1220 wells in Pennsylvania compared with 1603 in 1953; completion of 830 wells against 929 last year in New York; and 935 wells in Ohio in contrast with 966 during 1953.

Making the Forecast. The current forecast for drilling, like its predecessors over the past 21 years, is based on a survey of individual drilling programs of numerous oil companies and independent operators. Companies accounting for about one-third of all the wells drilled in the U. S. tell us how many wells they expect to drill in various states during the coming year.

When this information is consolidated and compared with drilling volumes of these companies in the preceding year, the data serve as a valuable indication of probable drilling trends in all parts of the nation. While such information is relied upon to a great extent, trends may be adjusted by WORLD OIL's editorial staff according to conditions which may affect drilling volumes.

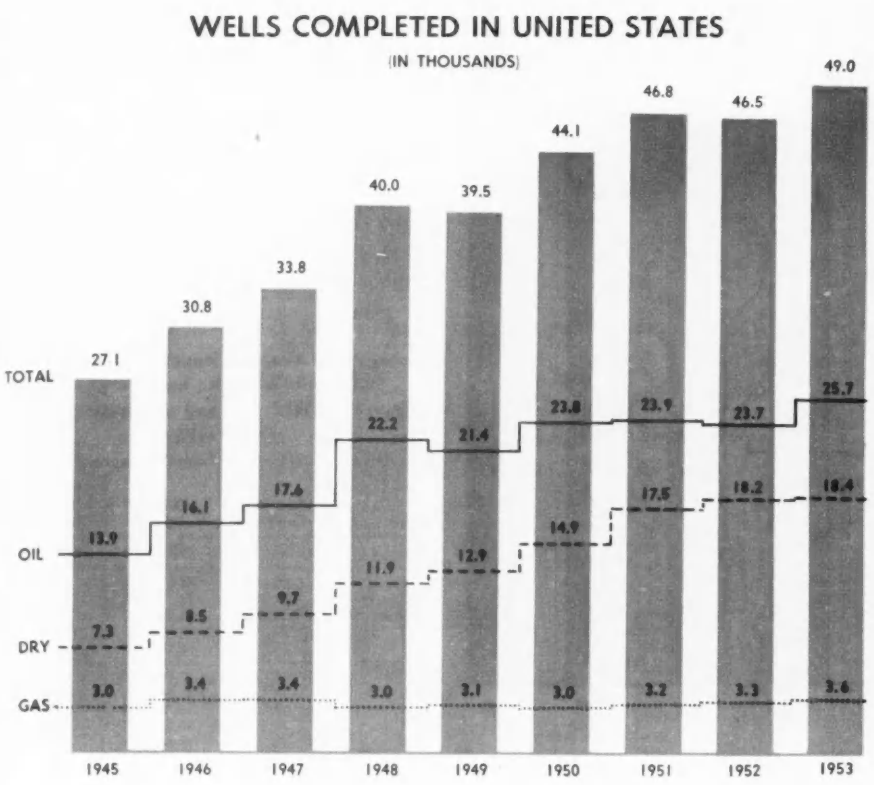
Neither the forecast for footage nor wells includes any allowance for old wells which are drilled deeper, but does cover all so-called "new wells," including salt water disposal and water or gas-input wells in addition to all tests drilled in search of oil and gas.

Indicated Number of Wells and Footage to Be Drilled in 1954

Forecast covers all new wells to be drilled for oil or gas in 1954, salt-water disposal wells, and water or gas-input wells for repressuring and secondary recovery, but does not estimate old wells drilled deeper.

STATE or DISTRICT	TOTAL NEW WELLS				WILDCAT TESTS				FOOTAGE (New Wells)			
	Forecast For 1954	Drilled In 1953	Percent Change From 1953	Percent of U. S. Total 1954	Forecast For 1954	Drilled In 1953	Percent Change From 1953	Percent New Wells 1954	Forecast For 1954	Drilled In 1953	Percent Change From 1953	Percent of U.S. Total 1954
Alabama	85	107	— 20.6	0.1	62	80	— 22.5	72.9	552,500	545,580	+ 1.3	0.2
Arizona	5	6	— 16.7	.....	5	6	— 16.7	100.0	18,000	19,960	— 9.8	.....
Arkansas	520	554	— 6.1	1.0	140	149	— 6.1	26.9	1,920,000	2,079,777	— 7.7	0.9
California	2,390	2,575	— 7.2	4.8	460	470	— 2.1	19.2	10,117,250	11,349,317	— 10.9	4.9
Colorado	780	699	+ 11.6	1.5	390	339	+ 15.0	50.0	4,149,600	3,639,412	+ 14.0	2.0
Florida	40	33	+ 21.2	.....	40	33	+ 21.2	100.0	250,000	205,666	+ 21.6	0.1
Illinois	2,425	2,164	+ 12.1	4.8	540	487	+ 10.9	22.3	6,062,500	5,429,192	+ 11.7	2.9
Indiana	1,350	1,299	+ 3.9	2.7	405	397	+ 2.0	30.0	2,430,000	2,158,287	+ 12.6	1.1
Kansas	4,240	4,451	— 4.8	8.5	1,018	1,040	— 2.1	24.0	14,632,800	15,490,479	— 5.5	7.0
Kentucky	1,215	1,395	— 12.9	2.4	134	134	.....	11.0	2,344,950	2,660,572	— 11.9	1.1
Louisiana	3,170	2,733	+ 16.0	6.4	532	444	+ 19.8	16.8	23,592,000	18,646,075	+ 26.5	11.4
North Louisiana	1,260	1,248	+ 1.0	2.5	227	210	+ 8.1	18.0	4,892,000	4,365,997	+ 12.0	2.4
South Louisiana	1,910	1,485	+ 28.6	3.8	305	234	+ 30.3	16.0	18,700,000	14,280,078	+ 31.0	9.0
Maryland	4	5	— 20.0	.....	1	.....	.....	25.0	16,000	19,715	— 18.9	.....
Michigan	705	622	+ 13.3	1.4	303	273	+ 11.0	43.0	1,910,550	1,601,588	+ 19.3	0.9
Mississippi	480	422	+ 13.7	0.9	240	214	+ 12.1	50.0	3,456,000	2,897,226	+ 19.3	1.6
Missouri	40	45	— 11.1	.....	12	10	+ 20.0	30.0	44,000	42,645	+ 3.2	.....
Montana	420	409	+ 2.7	0.8	130	128	+ 1.6	31.0	1,596,000	1,824,273	— 12.5	0.7
Nebraska	305	314	— 2.9	0.6	153	157	— 2.6	50.2	1,540,250	1,619,722	— 4.9	0.7
New Mexico	1,390	1,447	— 3.9	2.8	195	201	— 3.0	14.0	7,932,500	8,190,244	— 3.2	3.8
New York	830	929	— 10.7	1.6	.....	.....	.....	.....	1,153,700	1,294,907	— 10.9	0.5
North Dakota	225	269	— 16.4	0.4	113	92	+ 22.8	50.2	1,890,000	1,924,042	— 1.8	0.9
Ohio	935	966	— 3.2	1.8	19	13	+ 46.2	2.0	2,024,275	1,968,814	+ 2.8	0.9
Oklahoma	7,255	7,280	— 0.4	14.6	920	875	+ 5.1	12.7	26,810,125	25,555,956	+ 4.9	12.9
Pennsylvania	1,220	1,603	— 23.9	2.4	.....	.....	.....	.....	2,074,000	2,748,079	— 24.5	1.0
South Dakota	35	22	+ 59.1	.....	32	22	+ 45.5	91.4	227,500	101,331	+124.5	0.1
Tennessee	45	52	— 13.5	.....	2	2	.....	4.4	55,800	35,903	+ 55.4	.....
Texas	17,685	17,041	+ 3.8	35.6	4,983	4,847	+ 2.8	28.2	82,377,850	82,203,875	+ 5.9	39.8
Dist. 1—S. Central	810	857	— 5.5	1.6	305	339	— 10.0	37.7	2,130,000	2,738,947	— 22.2	1.0
Dist. 2—Middle Gulf	985	807	+ 22.1	1.9	365	315	+ 15.9	37.0	6,343,400	4,959,409	+ 27.9	3.1
Dist. 3—Upper Gulf	1,890	1,673	+ 13.0	3.8	473	433	+ 9.2	25.0	12,593,000	11,239,267	+ 12.0	6.1
Dist. 4—Lower Gulf-S.W.	1,730	1,833	— 5.6	3.4	519	577	— 10.1	30.2	9,588,000	10,394,598	— 7.8	4.6
Dist. 5 & 6—East	910	791	+ 15.0	1.8	305	284	+ 7.4	33.5	5,132,400	4,169,233	+ 23.1	2.5
Dist. 7-B & 9—North	6,975	6,769	+ 3.0	14.0	2,093	2,007	+ 4.3	30.0	22,320,000	22,186,128	+ 0.6	10.8
Dist. 7-C & 8—West	3,595	3,691	— 2.6	7.2	899	877	+ 2.5	25.0	21,758,850	20,150,787	+ 8.0	10.5
Dist. 10—Panhandle	790	620	+ 27.4	1.6	24	15	+ 60.0	3.0	2,512,200	1,955,264	+ 28.5	1.2
Utah	75	81	— 7.4	0.1	53	57	— 7.0	70.7	487,500	433,014	+ 12.6	0.2
West Virginia	650	607	+ 7.1	1.3	5	.....	.....	0.8	1,898,000	1,685,803	+ 12.6	0.9
Wyoming	1,020	887	+ 15.0	2.0	255	183	+ 39.3	25.0	4,900,000	4,444,739	+ 10.2	2.3
Other States[1]	25	22	+ 13.6	.....	25	22	+ 13.6	100.0	75,000	60,237	+ 24.5	.....
United States Totals	49,564	49,039	+ 1.1	100.0	11,167	10,675	+ 4.6	22.5	206,538,650	196,466,188	+ 5.1	100.0

[1] Other states include, Georgia, Idaho, Nevada and North Carolina.



Completions and Footage . . .

year-end surge produces new records in wells and footage.

INDUSTRY ENTERED the new year on a surging trend of activity that produced history's greatest number of new wells and footage drilled during 1953.

New wells completed totaled 49,039, which was 2530 wells or 5.4 percent above 1952's record.

Footage drilled amounted to 196,466,188 feet, a gain of 8,073,493 feet or 4.3 percent over the 1952 record.

Only in average depth per well did the industry fail to register a new peak performance. This figure dwindled by an insignificant 45 feet to an average of 4006. This was the first time since 1949 that the average depth per well had failed to increase from one year to the next.

The lower average depth reflected relatively larger increases in drilling in shallower areas than in the deeper areas. For example, Oklahoma, with below average drilling depth, had a 28 percent increase in completions; while Texas, with above-average depth, had a small decrease in drilling. In both of those states of voluminous drilling, moreover, the average depths of completions were shallower in 1953 than in 1952, averaging 3510 feet per well in Oklahoma and 4565 feet in Texas.

South Louisiana remains the area of the deepest drilling in the U. S., although its average depth of 9616 feet per well for nearly 1500 wells in 1953 was less than the 9978-foot average for nearly 1100 wells in 1952. Booming North Dakota was the No. 2 deep drilling area, with 269 new wells averaging 7153 feet deep, and Mississippi was third, with 422 completions averaging 6865 feet in depth.

The increase in activity in 1953 was scattered through both deep and shallow areas. Among the deep-zone regions, South Louisiana was the leader in heightened activity. This area had 399 more wells for a year's total of 1485, and a total footage of 14,280,078 for a gain of 3,443,494—almost half of the increase registered by the entire U. S.

Other spectacular deep-zone gains were made in the Rocky Mountain states. North Dakota's total of new wells jumped from 96 to 269 and its footage leap-frogged from 805,049 to 1,924,042. Wyoming jumped its well total from 654 to 887 and its footage from 3,276,588 to 4,444,739. Colorado also scored a respectable gain. Its well total moved from 483 to 699 and its footage from 2,566,803 to 3,639,412.

New Mexico had another year of solid gains. Its well total, which had increased 369 in 1952, moved up another 361 to a 1447 total in the ensuing 12 months. Footage kept pace with 8,190,244 compared with 6,047,801 the previous year.

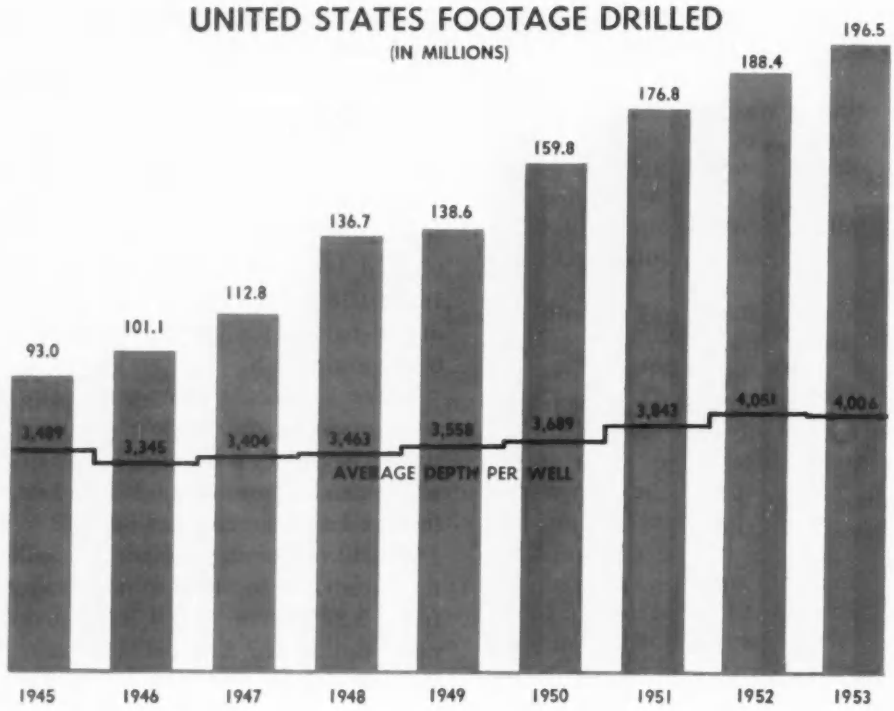
Greatest footage increase accomplished by any region was credited to Oklahoma, which had a busy year of medium-zone drilling. Oklahoma's footage total went to 25,555,956—up 4,106,173 feet—and its well total was 7280, representing another best-in-the-nation gain of 1595.

Neighboring Kansas also followed the uptrend in wells drilled, by completing 4451 new ones, a gain of 269. The state's footage gained 978,867 feet for a total of 15,490,479.

North Texas was another big gainer among the mid-zone regions. The area had a 492 increase in new wells to 3658, and a footage increase of 1,784,063 for a year's accumulation of 12,104,296.

Virtually every other mid-zone region in Texas also picked up, which helped to offset the decline in the state's deep areas. As a whole, the state had 17,041 new wells, down 354 from the year before and bringing the two-year decline to 815. The state's footage in 1953 was 77,793,633, which was 5,536,493 less than the previous year.

Heavy contributors to the state's deficit were West Texas (District 8),



down 752 wells, and West Central Texas (District 7-C), down 682.

The Lower Gulf Coast (District 4) offered a noteworthy contrast to lessening activity in the state's deeper areas. This region had 222 more new wells than the year before for an 1833 total, and its footage increased 1,736,033 feet to 10,394,598.

Footage and Average Depths Drilled in New Wells in U. S., by Years
Source: WORLD OIL and predecessor, The Oil Weekly.

YEAR	New Wells Completed	Footage Drilled	Average Depth per Well
1925	26,412	76,594,800	2900
1926	29,456	82,476,800	2800
1927	24,089	72,267,000	3000
1928	24,765	74,295,000	3000
1929	30,363	88,052,700	2900
1930	23,711	68,761,900	2900
1931	12,959	37,892,116	2924
1932	15,836	47,682,196	3011
1933	13,523	39,568,298	2926
1934	21,122	56,141,433	2658
1935	24,581	67,844,939	2760
1936	28,962	80,996,816	2797
1937	35,213	105,099,189	2985
1938	29,127	90,585,158	3110
1939	28,012	85,523,094	3053
1940	31,149	96,182,605	3088
1941	32,510	99,347,714	3056
1942	21,990	67,903,053	3088
1943	20,349	61,991,857	3046
1944	25,786	84,378,457	3272
1945	26,649	92,982,113	3489
1946	30,230	101,124,813	3345
1947	33,147	112,816,124	3404
1948	39,477	136,709,153	3463
1949	38,962	138,616,941	3558
1950	43,307	159,761,732	3689
1951	45,996	176,757,221	3843
1952	46,509	188,378,059	4051
1953	49,039	196,466,188	4006

Wells Completed Annually in United States

Source: WORLD OIL and predecessor, The Oil Weekly, with aid of other authoritative sources, 1921 to now; 1920 and earlier years from U. S. Bureau of Mines and "Petroleum in the United States and Possessions," by Arnold and Kemnitzer

YEAR	NEW WELLS								Old Wells Drilled Deeper	Total Completions
	Oil	Distillate	Gas	Dry	Water Input	Gas Injection	Salt Water Disposal	Total New Wells		
1859-1917	380,502	....	20,183	91,821	.....	....	....	492,506	....	492,506
1918	17,860	....	2,324	5,629	.....	....	....	25,813	....	25,813
1919	21,041	....	2,153	6,075	.....	....	....	29,269	....	29,269
1920	24,278	....	2,275	7,476	.....	....	....	34,029	....	34,029
1921	14,715	....	2,081	5,193	.....	....	....	21,989	....	21,989
1922	17,790	....	1,926	5,191	.....	....	....	24,907	....	24,907
1923	16,182	....	2,140	6,043	.....	....	....	24,365	....	24,365
1924	14,707	....	2,172	5,591	.....	....	....	22,470	....	22,470
1925	17,029	....	2,536	6,847	.....	....	....	26,412	....	26,412
1926	18,626	....	2,502	8,328	.....	....	....	29,456	....	29,456
1927	14,382	....	2,494	7,213	.....	....	....	24,089	....	24,089
1928	12,505	....	2,754	7,154	2,342	....	....	24,765	....	24,765
1929	15,758	....	3,107	7,600	3,898	....	....	30,363	....	30,363
1930	12,133	....	2,971	6,163	2,444	....	....	23,711	....	23,711
1931	7,061	....	2,067	3,264	567	....	....	12,959	....	12,959
1932	10,569	....	1,079	3,389	799	....	....	15,836	....	15,836
1933	7,887	....	1,190	3,492	954	....	....	13,523	....	13,523
1934	13,119	....	1,496	4,811	1,696	....	....	21,122	....	21,122
1935	15,418	....	1,802	5,696	1,665	....	....	24,581	....	24,581
1936	18,704	....	2,375	5,787	2,096	....	....	28,962	....	28,962
1937	23,115	....	2,732	6,627	2,739	....	....	35,213	....	35,213
1938	19,106	....	2,143	6,515	1,363	....	....	29,127	....	29,127
1939	17,734	....	2,030	6,890	1,358	....	....	28,012	....	28,012
1940	19,843	....	2,265	7,053	1,988	....	....	31,149	....	31,499
1941	19,590	....	3,279	7,280	2,197	117	47	32,510	822	33,332
1942	10,977	105	2,685	5,962	2,141	73	47	21,990	588	22,578
1943	9,887	76	2,314	6,364	1,576	90	42	20,349	471	20,820
1944	13,502	54	3,024	7,153	1,784	218	51	25,786	377	26,163
1945	13,944	153	3,039	7,346*	1,796	329	42	26,649	491	27,140
1946	16,087	207	3,355	8,496	1,816	219	50	30,230	615	30,845
1947	17,613	283	3,437	9,751	1,861	156	46	33,147	651	33,798
1948	22,197	346	2,966	11,939	1,885	84	60	39,477	533	40,010
1949	21,415	378	3,121	12,898	1,036	56	58	38,962	535	39,497
1950	23,775	465	3,015	14,918	993	38	103	43,307	751	44,058
1951	23,532	344	3,198	17,497	1,323	35	67	45,996	770	46,766
1952	23,371	348	3,345	18,211	1,147	25	62	46,509	537	47,046
1953*	25,323	374	3,594	18,449	1,090	18	91	49,039	486	49,525
Total	1,201,277	3,133	111,169	376,122	44,554	1,458	766	1,528,579	7,627	1,536,206

* Data for 1953 subject to slight revisions.

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Footage and Average Depths Drilled in All Wells in the United States in 1953

STATE or DISTRICT	OIL			DISTILLATE			GAS			DRY			WATER INPUT			GAS INPUT		
	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth
Alabama	16	85,167	5,323							91	460,413	5,059						
Arizona										6	19,960	3,327						
Arkansas	273	996,529	3,650	1	6,387	6,387	11	40,308	3,664	268	1,032,902	3,854						
California	1,887	8,336,450	4,418				44	174,617	3,969	644	2,838,250	4,407						
Colorado	248	1,350,697	5,446	1	5,714	5,714	54	204,486	3,787	396	2,078,515	5,249						
Florida										33	205,666	6,232						
Georgia										9	24,804	2,756						
Idaho										4	22,748	5,687						
Illinois	1,069	2,841,646	2,658				6	5,314	886	1,089	2,582,232	2,371						
Indiana	477	806,975	1,692				23	26,343	1,145	795	1,318,759	1,659	3	4,350	1,450			
Kansas	2,041	6,928,255	3,395				373	1,144,516	3,068	1,992	7,250,732	3,640						
Kentucky	517	850,934	1,650				193	445,256	2,307	679	1,353,505	1,942	4	7,472	1,868	1	1,550	1,550
Louisiana	1,439	8,671,115	6,026	71	788,707	11,109	289	2,335,795	8,082	931	6,818,528	7,324				1	11,410	11,410
North Louisiana	679	1,728,535	2,546	12	107,616	8,968	120	541,497	4,512	437	1,988,349	4,550						
South Louisiana	760	6,942,580	9,135	59	681,091	11,544	169	1,794,298	10,617	494	4,830,179	9,778				1	11,410	11,410
Maryland							3	11,517	3,839	2	8,198	4,099						
Michigan	244	678,439	2,780				19	39,922	2,101	359	883,227	2,460						
Mississippi	123	817,470	6,646	18	137,001	7,611	13	92,484	7,114	268	1,850,271	6,904						
Missouri	28	25,938	926							17	16,707	983						
Montana	192	833,179	4,339				13	35,760	2,751	204	955,334	4,683						
Nebraska	120	666,302	5,553				11	50,600	4,600	183	902,820	4,933						
Nevada										8	11,115	1,389						
New Mexico	585	4,194,822	7,171	2	19,531	9,766	610	2,566,813	4,208	249	1,408,329	5,656	1	749	749			
New York	566	785,378	1,388										363	509,529	1,404			
North Carolina										1	1,570	1,570						
North Dakota	170	1,399,519	8,232				1	303	303	98	524,220	5,349						
Ohio	453	923,433	2,038				175	397,167	2,266	336	645,143	1,920	2	3,071	1,536			
Oklahoma	4,409	15,794,948	3,537	16	94,783	5,924	356	1,219,173	3,425	2,440	8,301,525	3,402	30	79,489	2,650	2	4,930	2,465
Pennsylvania	724	1,165,369	1,610				115	300,743	2,615	37	116,586	3,151	621	995,463	1,603	106	169,918	
South Dakota										22	101,331	4,606						
Tennessee	4	3,084	771							48	32,819	684						
Texas	9,035	40,613,707	4,495	265	2,172,097	7,612	836	4,573,019	5,470	6,817	30,257,242	4,438	66	118,272	1,792	8	29,603	3,700
Dist. 1: S. Central	441	1,314,901	2,982	7	54,676	7,811	10	52,600	5,260	399	1,316,770	3,300						
Dist. 2: Middle Gulf	272	1,709,075	6,283	37	292,511	7,906	114	670,671	5,883	384	2,287,152	5,956						
Dist. 3: Upper Gulf	777	4,723,208	6,079	93	841,873	9,052	98	747,999	7,633	704	4,924,568	6,995						
Dist. 4: Lower Gulf-S.W.	804	4,434,371	5,515	104	805,768	7,748	191	1,228,482	6,432	731	3,913,337	5,353				1	9,600	9,600
Dist. 5: East Central	87	303,198	3,485	3	23,931	7,977	11	82,608	7,510	174	689,312	3,962						
Dist. 6: Northeast	154	896,818	5,823	5	34,809	6,962	115	780,737	6,789	241	1,352,220	5,611						
Dist. 7-B: North Central	1,564	5,109,311	3,267	1	4,019	4,019	37	109,724	2,966	1,506	4,853,051	3,222	2	3,947	1,979			
Dist. 7-C: West Central	796	4,144,447	5,207	10	81,043	8,104	11	70,832	6,439	498	2,220,054	4,458	2	7,818	3,909	1	5,490	5,490
Dist. 8: West	1,778	10,076,929	5,668	4	28,337	7,084	15	103,809	6,921	572	3,405,009	5,953	4	7,019	1,755			
Dist. 9: North	1,992	6,693,560	3,360	1	5,130	5,130	27	146,360	5,421	1,565	5,127,591	3,276	58	99,488	1,715	6	14,513	2,419
Dist. 10: Panhandle	370	1,207,889	3,265				207	579,197	2,798	43	168,178	3,911						
Utah	18	118,034	6,557				11	53,953	4,905	52	261,027	5,020						
Virginia																		
Washington																		
West Virginia	73	141,769	1,942				415	1,212,220	2,921	119	331,814	2,788						
Wyoming	612	3,106,235	5,076				23	93,387	4,060	252	1,245,117	4,941						
Total United States	25,323	102,135,394	4,033	374	3,224,220	8,621	3,594	15,023,696	4,180	18,449	73,861,409	4,004	1,090	1,718,395	1,577	118	217,411	1,842

STATE or DISTRICT	SALT WATER DISPOSAL			TOTAL NEW WELLS (Preceding Classes) 1953			TOTAL NEW WELLS (Preceding Classes) 1952			OLD WELLS DRILLED DEEPER 1953 (Productive and Dry)			TOTAL ALL WELLS 1953			TOTAL ALL WELLS 1952		
	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth	Wells	Footage	Avge. Depth
Alabama				107	545,580	5,099	75	457,085	6,094	1	810	810	108	546,390	5,059	75	457,085	6,094
Arizona				6	19,960	3,327	2	10,755	5,378				6	19,960	3,327	2	10,755	5,378
Arkansas	1	3,651	3,651	554	2,079,777	3,754	432	1,615,666	3,740	5	1,173	235	559	2,080,950	3,723	436	1,618,191	3,711
California				2,575	11,349,317	4,408	2,459	10,512,469	4,275	89	78,262	879	2,664	11,427,579	4,290	2,517	10,554,610	4,193
Colorado				699	3,639,412	5,207	483	2,566,803	5,314	6	9,064	1,511	705	3,648,476	5,175	485	2,576,748	5,313
Florida				33	205,666	6,232	9	55,813	6,201				33	205,666	6,232	9	55,813	6,201
Georgia				9	24,804	2,756							9	24,804	2,756			
Idaho				4	22,748	5,687	2	14,636	7,318				4	22,748	5,687	2	14,636	7,318
Illinois				2,164	5,429,192	2,509	2,089	5,183,931	2,482	1	864	864	2,165	5,430,056	2,508	2,091	5,184,976	2,480
Indiana	1	1,860	1,860	1,299	2,158,287	1,661	1,346	2,416,511	1,795				1,299	2,158,287	1,661	1,349	2,418,706	1,793
Iowa							1	2,335	2,335							1	2,335	2,335
Kansas	45	166,976	3,711	4,451	15,490,479	3,480	4,182	14,511,612	3,470				4,451	15,490,479	3,480	4,182	14,511,612	3,470
Kentucky	1	1,855	1,855	1,395	2,660,572	1,907	1,863	3,475,300	1,865				1,395	2,660,572	1,907	1,863	3,475,300	1,865
Louisiana	2	20,520	10,260	2,733	18,646,075	6,823	2,395	15,862,476	6,623	11	20,473	1,861	2,744	18,666,548	6,803	2,406	15,877,668	6,599
North Louisiana				1,248	4,365,997	3,498	1,309	5,025,892	3,839	2	5,070	2,535	1,250	4,371,067	3,497	1,317	5,037,560	3,825
South Louisiana	2	20,520	10,260	1,485	14,280,078	9,616	1,806	10,836,584	9,978	9	15,403	1,711	1,494	14,295,481	9,569	1,089	10,840,108	9,954
Maryland				5	19,715	3,943	34	136,053	4,002				5	19,715	3,943	34	136,053	4,002
Michigan				622	1,601,588	2,575	643	1,740,515	2,707	6	4,404	734	628	1,605,992	2,557	649	1,749,465	2,696
Mississippi				422	2,897,226	6,865	346	2,492,239	7,203	2	1,396	698	424	2,898,622	6,836	346	2,492,239	7,203
Missouri				45	42,645	948	30	30,600	1,020				45	42,645	948	31	30,702	990
Montana				409	1,824,273	4,460	324	1,153,174	3,559	5	8,593	1,719	414	1,832,866	4,427	326	1,156,562	3,548
Nebraska				314	1,619,722	5,158	256	1,322,496	5,166				314	1,619,722	5,158	257	1,324,971	5,156
Nevada				8	11,115	1,389	1	11,543	11,543				8	11,115	1,389	1	11,543	11,543
New Mexico				1,447	8,190,244	5,660	1,086	6,047,801	5,569	7	19,637	2,805	1,454	8,209,881	5,646	1,091	6,059,086	5,554
New York				929	1,294,907	1,394	1,090	1,589,759	1,457				929	1,294,907	1,394	1,090	1,587,759	1,457
North Carolina				1	1,570	1,570							1	1,570	1,570			
North Dakota				269	1,924,042	7,153	96	805,049	8,386				269	1,924,042	7,153	96	805,049	8,386
Ohio				966	1,968,814	2,038	983	2,128,457	2,165	9	7,426	825	975	1,976,240	2,027	995	2,136,950	2,148
Oklahoma	27	61,108	2,263	7,280	25,555,956	3,510	5,685	21,449,783	3,773	151	97,505	646	7,431	25,653,461	3,452	5,822	21,534,094	3,699
Oregon																		
Pennsylvania				1,603	2,748,079	1,714	1,778	3,786,954	2,130	17	27,066	1,592	1,620	2,775,145	1,713	1,805	3,814,818	2,113
South Dakota				22	101,331	4,606	16	58,219	3,639				22	101,331	4,606	16	58,219	3,639
Tennessee				52	35,903	690	71	50,800	715				52	35,903	690	71	50,800	715
Texas	14	29,693	2,121	17,041	77,793,633	4,565	17,395	83,330,126	4,790	172	123,601	719	17,213	77,917,234	4,527	17,635	83,500,066	4,735
Dist. 1: South Central				857	2,738,947	3,196	780	2,313,624	2,966	2	1,624	812	859	2,740,571	3,190	780	2,313,624	2,966
Dist. 2: Middle Gulf				807	4,959,409	6,145	816	5,185,153	6,354				807	4,959,409	6,145	819	5,188,009	6,335
Dist. 3: Upper Gulf	1	1,619	1,619	1,673	11,239,267	6,718	1,743	11,611,731	6,662	11	13,169	1,197	1,684	11,252,436	6,682	1,756	11,633,310	6,625
Dist. 4: L. Gulf-S.W.	2	3,040	1,520	1,833	10,394,598	5,702	1,611	8,658,565	5,375	1	853	853	1,834	10,395,451	5,668	1,615	8,663,050	5,364
Dist. 5: East Central				275	1,099,049	3,997	347	1,715,185	4,943	2	544	272	277	1,099,593	3,970	347	1,715,185	4,943
Dist. 6: Nertheast	1	5,600	5,600	516	3,070,184	5,950	507	3,106,295	6,127				516	3,070,184	5,950	508	3,108,547	6,119
Dist. 7-B: N. Central	1	1,780	1,780	3,111	10,081,832	3,241	2,738	8,588,112	3,137	15	12,626	842	3,126	10,094,458	3,229	2,751	8,595,559	3,125
Dist. 7-C: W. Central				1,318	6,529,684	4,954	2,000	11,714,265	5,857	31	24,835	801	1,349	6,554,519	4,859	2,035	11,745,082	5,772
Dist. 8: West				2,373	13,621,103	5,740	3,125	18,332,396	5,866	103	66,435	645	2,476	13,687,538	5,528	3,291	18,425,334	5,599
Dist. 9: North	9	17,654	1,962	3,658	12,104,296	3,309	3,166	10,320,233	3,260	7	3,515	502	3,665	12,107,811	3,304	3,171	10,327,799	3,257
Dist. 10: Panhandle				620	1,955,264	3,154	562	1,784,567	3,175				620	1,955,264	3,154	562	1,784,567	3,175
Utah				81	433,014	5,346	77	498,262	6,471				81	433,014	5,346	79	502,005	6,354
Virginia							22	98,288	4,467							22	98,288	4,467
Washington							2	9,468	4,734							2	9,468	4,734
West Virginia				607	1,685,803	2,777	582	1,693,129	2,090	3	2,658	886	610	1,688,461	2,768	587	1,697,488	2,892
Wyoming				887	4,444,739	5,011	654	3,276,588	5,010	1	5,530	5,530	888	4,450,269	4,961	673	3,351,097	4,979
Total United States	91	285,663	3,139	49,039	196,466,188	4,006	46,509	188,392,695	4,051	486	408,462	840	49,525	196,874,650	3,975	47,046	188,865,157	4,014

Wells Completed . . . Smaller companies own 37,689 or 76.9 percent of 49,039 wells drilled. Big companies account for bulk of production.

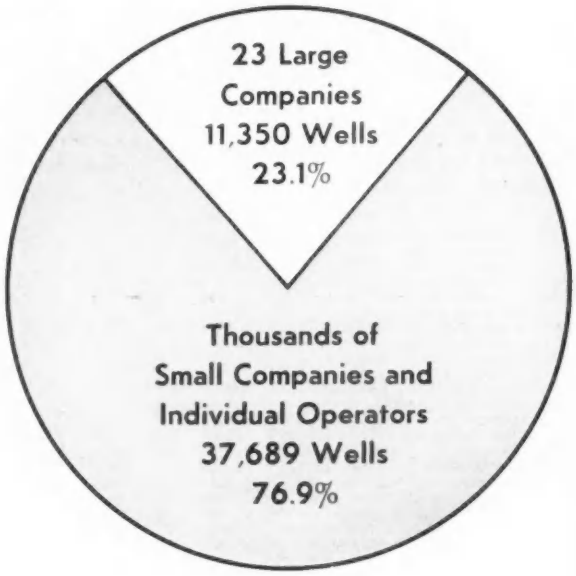
LARGER U. S. PRODUCING companies continue to drill less than one fourth of the wells completed in the nation, though accounting for a much higher proportion of the crude production.

Of the 49,039 wells drilled in 1953, the 23 largest producing companies owned only 23.1 percent, or 11,350, of the wells. These companies normally produce about 60 percent of the nation's oil, holding many of the choice properties.

The smaller companies owned 76.9 percent of the wells drilled in 1953, or 37,689 wells. They operate many properties yielding limited output per well, do much drilling on water flood properties, and drill many wildcats which do not produce oil.

The above proportions of well completions accounted for by large and small operators were the same as for 1952. The 23 large companies drilled 10,738 wells, or 23.1 percent of the 46,507 wells completed in the country. The small companies meanwhile drilled 35,769 wells.

In 1951, the 23 larger companies owned 23.7 percent and other companies 76.3 percent of the 45,996 wells drilled.



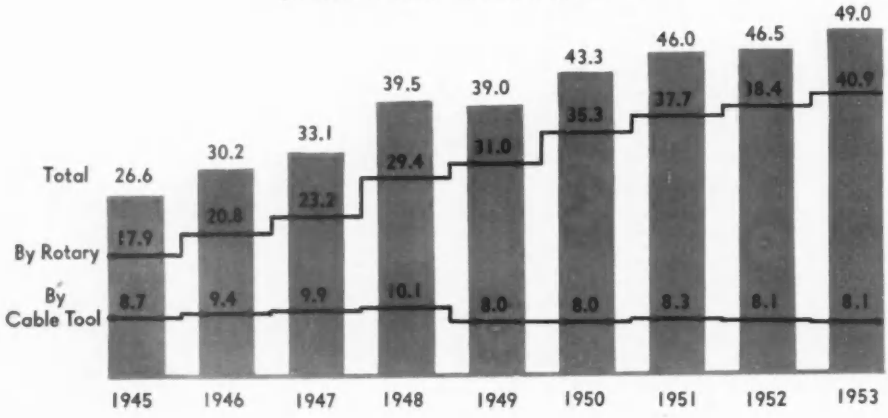
Wells Drilled . . . Rotary method widens margin, accounting for 40,948 of total U. S. wells or 83.5 percent compared to 67.2 in 1945.

THE NUMBER of U. S. wells drilled by the rotary method continues to increase. During 1953 it is estimated 83.5 percent of the U. S. wells were drilled by the rotary method. On this basis, rotary drilling accounted for 40,948 of the 49,039 wells drilled in the nation. The previous year, 38,368 of the 46,507 wells completed were drilled by rotary rigs.

Rotary drilling is estimated to have been responsible for only 67.2 percent of the wells drilled in 1945 and 69 percent in 1946. With the great increase in total drilling operations since that time, the number of wells drilled by rotary rigs has doubled since 1946.

Cable tool rigs did a smaller part of the drilling because of a slump in activity in the eastern states. Credited with the drilling of 16.5 percent of the wells, cable tools accounted for 8091 wells in 1953. Cable tools are estimated to have drilled 8139 wells in 1952 and 8279 during 1951.

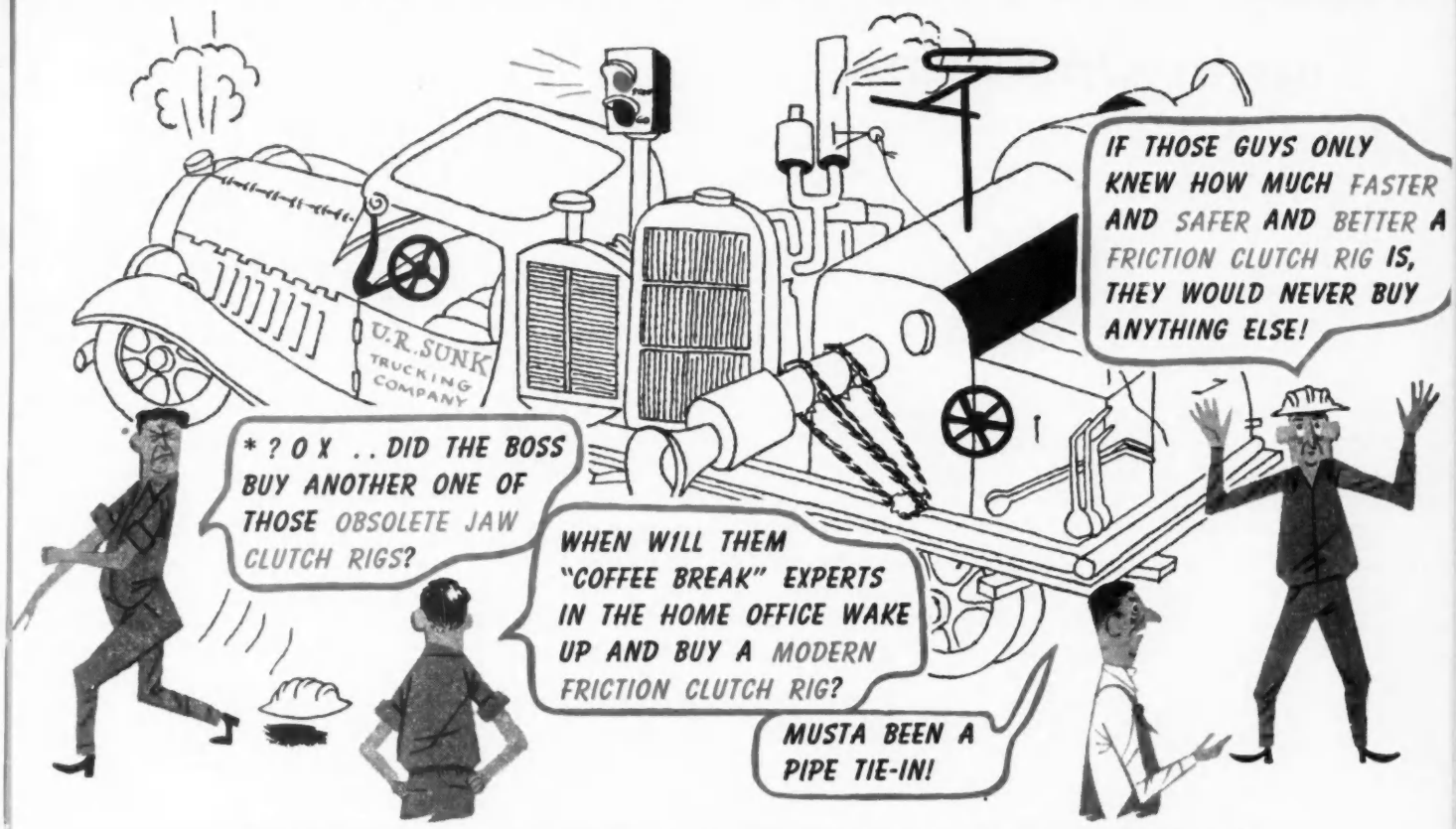
UNITED STATES DRILLING METHODS
(THOUSANDS OF WELLS YEARLY)



Estimated Number and Percentages of Wells Drilled in U. S. by Rotary and Cable Tool Methods, by Years

YEAR	Total New Wells	ROTARY		CABLE	
		Wells	Percent	Wells	Percent
1945	26,649	17,908	67.2	8,741	32.5
1946	30,230	20,859	69.0	9,371	31.0
1947	33,147	23,269	70.2	9,878	29.8
1948	39,477	29,410	74.5	10,067	25.5
1949	38,962	30,975	79.5	7,987	20.5
1950	43,307	35,295	81.5	8,012	18.5
1951	45,996	37,717	82.0	8,279	18.0
1952	46,507	38,368	82.5	8,139	17.5
1953	49,039	40,948	83.5	8,091	16.5

DON'T BUY AN OBSOLETE RIG!


U.R.SUNK
TRUCKING
COMPANY
IF THOSE GUYS ONLY KNEW HOW MUCH FASTER AND SAFER AND BETTER A FRICTION CLUTCH RIG IS, THEY WOULD NEVER BUY ANYTHING ELSE!
*?0X .. DID THE BOSS BUY ANOTHER ONE OF THOSE OBSOLETE JAW CLUTCH RIGS?
WHEN WILL THEM "COFFEE BREAK" EXPERTS IN THE HOME OFFICE WAKE UP AND BUY A MODERN FRICTION CLUTCH RIG?
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Rated Capacity
10,000 feet with 4½" drill pipe

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The FIRST NAME in DRILLING RIGS!

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Rigs in Operation . . . Monthly average in '53 4784, 1.5 percent below '52. Fewer rigs drilling more holes and more footage.

THE EFFICIENCY with which the oil quest is being continued this year is told in figures revealing that fewer rigs drilled more holes and more footage in the U. S. during 1953.

The average number of rigs in operation at the end of each month in 1953 was 4784, or 1.5 percent fewer than in the previous year and also less than in 1950.

In contrast with 1952, which was unusual because of a paralyzing steel strike, the recent year got off to the normal slow start, picked up momentum as the months passed, and built up to a peak of 5047 at November's end.

Further pinpointing the 1953 performance was that the year contained only one month in which more than 5000 rigs were in use, whereas 1952—a year in which less footage and fewer holes were drilled—had six months in which more than 5000 rigs were busy.

The over-all decline in use of rigs came despite an increase in some of the biggest oil-producing states. At year's end, Texas had 1328 rigs in operation, up 3 from the comparable period a year before; Oklahoma had 656, up 37; California had 279, up 19; and Louisiana had 252, up 16.

The small gain registered by Texas was in the face of a 43-rig decline in the Lower Gulf District 4. Biggest gainer in the state was the Texas Panhandle with a 40-rig pickup.

Most active area in the nation was again West Texas District 8, which had 333 rigs in use at December's end, a gain of six over the like period a year before. This pickup, though scant, was a betterment of the record in 1952, when there was a 241-rig slump in this district.

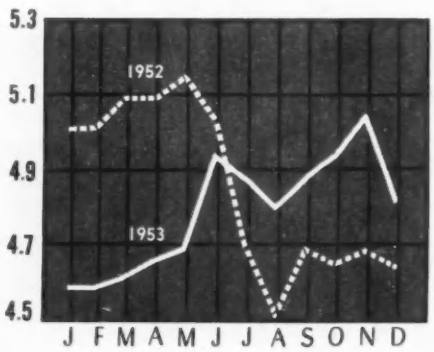
Among the most significant gainers was the Illinois Basin. At year's end Illinois had picked up 64 over the like period a year before for a total of 245 active rigs; Michigan gained 22 to 102; and Ohio gained 22 for a total of 188.

Notable declines were registered in Kansas, down 41 rigs to 403, and New Mexico, down 40 to 149.

U. S. Drilling Rigs in Use

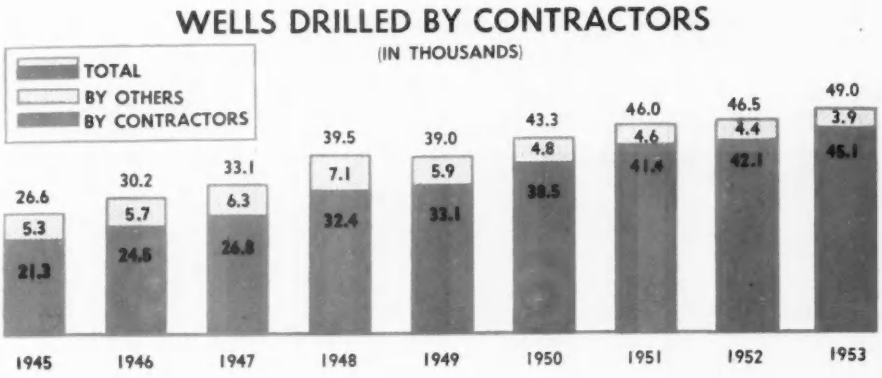
State or District	END of YEAR 1952	END of YEAR 1953	CHANGE Rigs	CHANGE Percent
Alabama	9	3	— 6	— 66.7
Arizona	4	2	— 2	— 50.0
Arkansas	28	39	+ 11	+ 39.3
California	260	279	+ 19	+ 7.3
Colorado	46	68	+ 22	+ 47.8
Florida	1	4	+ 3	+300.0
Georgia	1	2	+ 1	+100.0
Idaho	1	.....	— 1	—100.0
Illinois	181	245	+ 64	+ 35.4
Indiana	185	182	— 3	— 1.6
Kansas	444	403	— 41	— 9.2
Kentucky	86	93	+ 7	+ 8.1
Louisiana	236	252	+ 16	+ 6.8
North Louisiana	57	54	— 3	— 5.3
South Louisiana	179	198	+ 19	+ 10.6
Maryland	5	1	— 4	— 80.0
Michigan	80	102	+ 22	+ 27.5
Mississippi	35	29	— 6	— 17.1
Missouri	3	3	.....	0.0
Montana	57	48	— 9	— 15.8
Nebraska	20	18	— 2	— 10.0
Nevada	1	4	+ 3	+300.0
New Mexico	189	149	— 40	— 21.2
New York	106	100	— 6	— 5.7
North Dakota	33	28	— 4	— 12.1
Ohio	166	188	+ 22	+ 13.3
Oklahoma	619	656	+ 37	+ 6.0
Pennsylvania	227	227	.....	0.0
South Dakota	2	4	+ 2	+100.0
Tennessee	5	.....	— 5	—100.0
Texas	1,325	1,328	+ 3	+ 0.2
Dist. 1: South Central	39	24	— 15	— 38.5
Dist. 2: Middle Gulf	50	41	— 9	— 18.0
Dist. 3: Upper Gulf	113	120	+ 7	+ 6.2
Dist. 4: L. Gulf-S.W.	113	70	— 43	— 38.1
Dist. 5: East Central	18	9	— 9	— 50.0
Dist. 6: Northeast	37	58	+ 21	+ 56.8
Dist. 7-B: N. Central	140	150	+ 10	+ 7.1
Dist. 7-C: W. Central	133	144	+ 11	+ 8.3
Dist. 8: West	327	333	+ 6	+ 1.8
Dist. 9: North	280	264	— 16	— 5.7
Dist. 10: Panhandle	75	115	+ 40	+ 53.3
Utah	29	15	— 14	— 48.3
Washington	.....	1	+ 1	.....
West Virginia	185	195	+ 10	+ 5.4
Wyoming	80	134	+ 54	+ 67.5
Total	4,649	4,802	+153	+ 3.3

ACTIVE DRILLING RIGS IN U. S.
(In Thousands)



Drilling Rigs in Use in U. S., by Years, by Months
Figures are for end of month, and include rigs drilling, rigging up, and shut down

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg. for Year
1938	3,968	3,928	3,973	3,971	3,582	4,830	3,737	3,869	3,742	3,876	3,676	3,434	3,799
1939	3,583	3,391	3,448	3,630	3,695	3,726	3,567	3,718	3,625	3,905	3,981	3,924	3,683
1940	3,990	4,277	4,472	4,327	4,655	4,502	4,235	4,194	3,821	3,921	4,030	3,894	4,193
1941	3,814	3,952	4,121	4,287	4,335	4,598	4,819	4,984	4,693	4,672	4,746	4,336	4,446
1942	3,816	3,067	2,979	2,859	2,868	2,905	3,179	3,007	2,953	3,094	2,962	2,797	3,041
1943	2,691	2,653	2,732	2,756	2,743	2,852	3,015	3,201	3,031	3,548	3,676	3,595	3,041
1944	3,427	3,568	3,702	3,819	3,934	4,278	4,411	4,528	4,566	4,738	4,665	4,640	4,190
1945	4,270	4,154	4,159	4,374	4,637	4,394	4,424	4,289	4,356	4,521	4,426	4,637	4,387
1946	4,337	4,229	4,212	4,405	4,399	4,124	4,235	4,201	4,474	4,410	4,551	4,654	4,353
1947	4,390	4,402	4,379	4,470	4,603	4,802	4,992	5,163	4,979	4,897	4,871	4,945	4,741
1948	4,699	4,542	4,626	4,989	5,067	5,090	5,013	5,058	5,116	5,229	5,060	4,908	4,950
1949	4,511	4,490	4,368	4,265	4,276	4,097	4,015	4,118	4,258	4,247	4,485	4,355	4,290
1950	4,180	4,169	4,114	4,224	4,518	4,760	4,712	4,804	4,633	4,773	4,649	4,665	4,517
1951	4,275	4,339	4,435	4,600	4,831	4,762	4,989	4,988	5,237	5,260	5,234	5,182	4,844
1952	5,010	5,015	5,092	5,093	5,151	5,037	4,694	4,508	4,687	4,659	4,689	4,649	4,857
1953	4,585	4,585	4,611	4,661	4,693	4,935	4,878	4,997	4,879	4,939	5,047	4,802	4,784



Wells and Footage Drilled in U. S. by Contractors, by Years

Year	U. S. Totals		Indicated Work by Contractors		
	New Wells	Footage	% of U.S	Wells	Footage
1941..	32,510	99,347,714	72	23,407	71,503,354
1942..	21,990	67,903,053	70	15,393	47,532,137
1943..	20,349	61,991,857	75	15,262	46,492,893
1944..	25,786	84,378,457	78	20,113	65,815,196
1945..	26,649	92,982,113	80	21,319	74,385,690
1946..	30,230	101,124,813	81	24,486	81,911,096
1947..	33,147	112,816,124	81	26,849	91,381,060
1948..	39,477	136,709,153	82	32,371	112,101,505
1949..	38,962	138,616,941	85	33,118	117,824,400
1950..	43,307	159,761,732	89	38,543	142,187,941
1951..	45,996	176,757,221	90	41,396	159,081,496
1952..	46,507	188,160,597	91	42,321	171,226,143
1953..	40,039	196,466,188	92	45,116	180,748,893

Contract Drilling . . . increases for eleventh year as contractors account for 92 percent of the wells drilled in U. S.

THE NUMBER of U. S. wells drilled on a contract basis increased for the eleventh consecutive year in 1953. It is estimated that drilling contractors accounted for the drilling of 92 percent of the nation's wells. Ten years ago, contractors were doing only 70 percent of the drilling.

On the basis of doing 92 percent of the country's drilling, contractors drilled 45,116 of the 49,039 wells completed and 180,748,893 feet of the 196,466,188 feet of hole drilled during 1953. The previous year, when they did 91 percent of the drilling, contractors are estimated to have drilled 42,321 wells and 171,226,143 feet of hole.

The number of wells drilled by contractors has more than doubled since 1945, due to the increased proportion of work they have performed as well as the gain in total wells drilled in the U. S. The amount of footage drilled by contractors has nearly doubled since 1947.

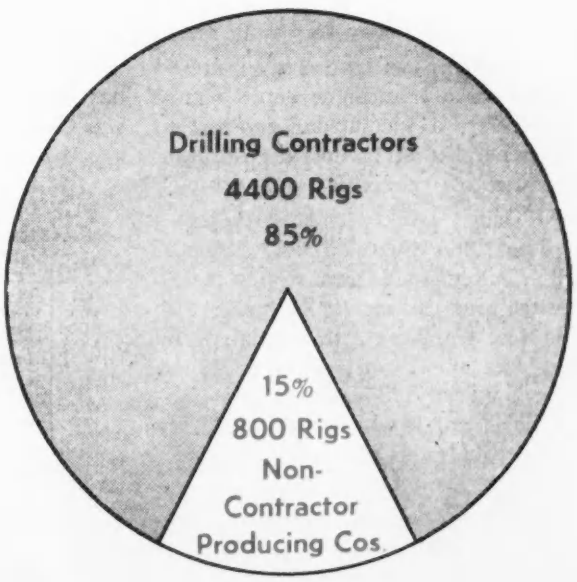
Rig Ownership . . . Contractors own approximately 4400 of the 5200 drilling rigs in the nation.

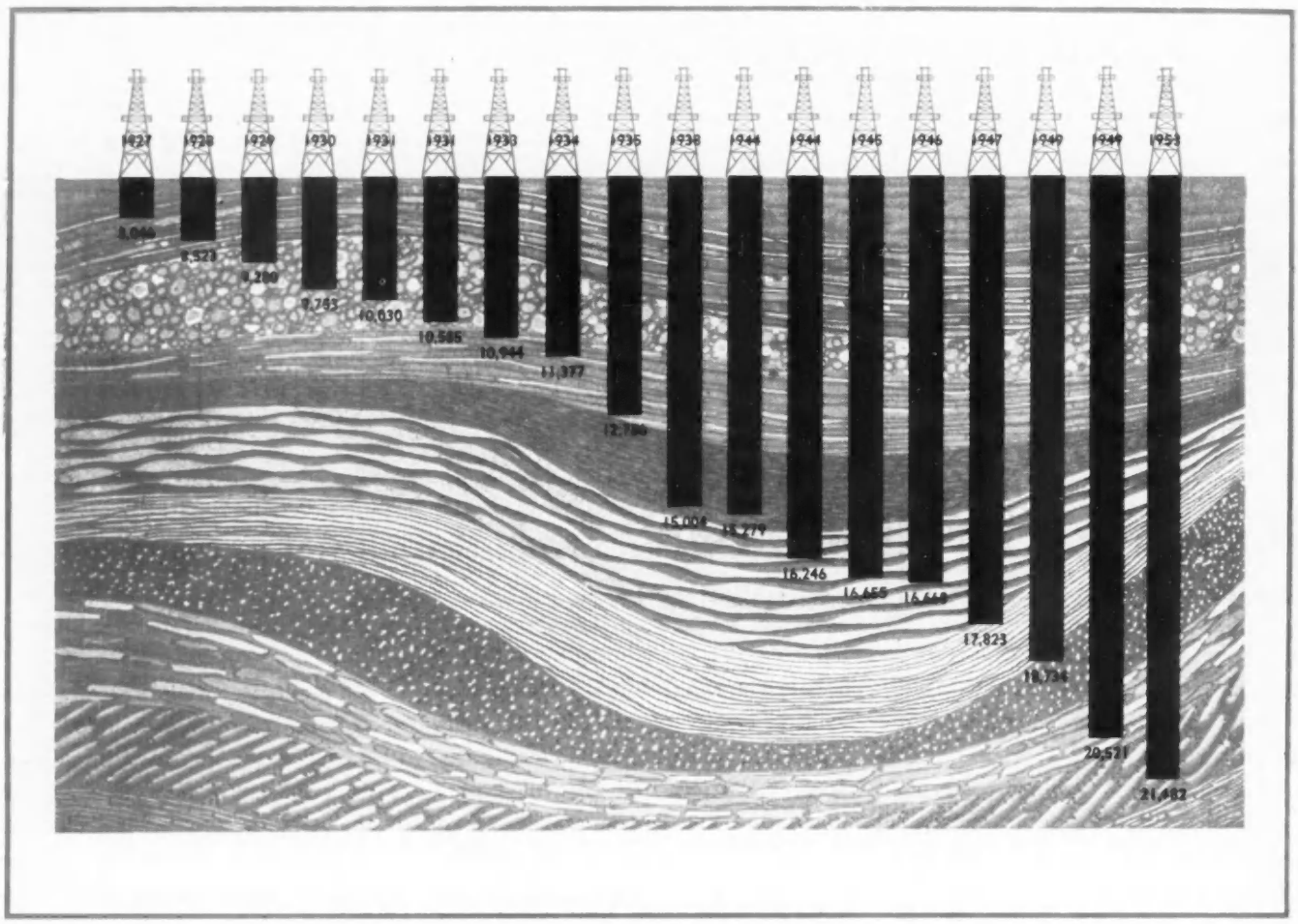
CONTRACTORS OWN a vast majority of the drilling rigs in the U. S. Of the approximately 5200 rigs in the nation, contractors own about 4400, or 85 percent of the total.

These figures are based on an industry-wide survey which determined the ownership of 4767 rigs, consisting of 3567 rotaries and an even 1200 cable tools. Service and workover rigs are not included in the figures.

Included in the contractors' rigs are an estimated 3200 rotaries and 1200 standard, or cable tool, rigs. That ownership amounts to 86.5 percent of the rotary rigs and 80 percent of the cable tool rigs, since it is indicated that there are 3700 rotary rigs and 1500 cable tool rigs.

The remaining 800 rigs, consisting of approximately 500 rotaries and 300 cable tool rigs, are owned by about 200 producing companies which do not engage in contract drilling. These companies use their rigs to drill some of their own wells.





Drilling Depth Records . . . Kern County well reaches 21,482 feet and returns record to California.

THE DRILLING INDUSTRY entered 1954 with a brand-new depth record that offers a spectacular contrast to the general trend against deep drilling because of economic and geologic factors.

The Ohio Oil Company KCL A 72-4, Paloma field, Kern County, California, was drilling at 21,482 feet as the new year began, thus breaking by 961 feet the record set in 1949 by The Superior Oil Company of California's Unit 1, which went to 20,521 feet in Sublette County, Wyo.

The Ohio well thus returned the depth record to the state which has held it most frequently in modern years. Of the 18 world record depth wells drilled since 1926, California has been the locale of 11. The state was the first to have a 10,000-foot well and the first with a 15,000-foot hole.

In sharp contrast to the achievement of the Ohio well, and of more

Holders of Record as Deepest Test Drilled
(Includes both Dry and Producing Wells)

Year	WELL and LOCATION	Feet
1927	Chansler-Canfield-Midway Oil Company's Olinda 96, Olinda, California	8,046
1928	Texon Oil and Land Company's University 1-B, Big Lake, West Texas	8,523
1929	Shell Oil Company's Nesa 1, Long Beach, California	9,280
1930	Standard Oil Company of California's Mascot 1, Midway, California	9,753
1931	Chansler-Canfield-Midway Oil Co.'s Hobsen A-2, Rincon field, Ventura County, California	10,030
1931	Penn-Mex Fuel Company's Jardin 35, State of Vera Cruz, Mexico	10,585
1933	North Kettleman O. & G. Co.'s (later Union Oil's Lillis-Welch 1) Kettleman Hills, California	10,944
1934	General Petroleum Corporation's Berry 1, Belridge, Kern County, California	11,377
1935	Gulf Oil Corporation's McElroy 103, Gulf-McElroy, Upton County, West Texas	12,786
1938	Continental Oil Company's KCL A-2, Wasco, Kern County, California	15,004
1944	Phillips Petroleum Company's Ada Price 1, Wildcat, Pecos County, West Texas	15,279
1944	Standard Oil Company of California's KCL 20-13, South Coles Levee, Kern County, California	16,246
1945	Phillips Petroleum Company's Schoeps 3, Wildcat, Brazos County, Gulf Coast, Texas	16,655
1946	Pacific Western Oil Corp.'s National Royalties 1, Miramonte area, Kern County, California	16,668
1947	Superior Oil Company of California's Weller 51-11, Wildcat, Caddo County, Oklahoma	17,823
1949	Superior Oil Company of California's Limoneria 1, Wildcat, Ventura County, California	18,734
1949	Superior Oil Company of California's Unit 1, Wildcat, Sublette County, Wyoming	20,521
1953	Ohio Oil Co.'s Kern County Lands "A" 72-4, Paloma field, Kern Co., California, still drilling	21,482

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Four other areas set new drilling depth records during 1953

significance to the drilling pattern, was the abrupt decline in the number of area depth records set during the old year. Including the California mark, five area records were tumbled in 1953, which was the lowest number since the war. There were 10 new area records in 1945, 12 in 1946, 15 in 1947, 9 in 1948, 12 in 1949, 8 in 1950, 9 in 1951, and 10 in 1952.

Other areas given new depth records last year were West Texas, New Mexico, North Texas and New York. The latter state's new mark of 11,145 replaced a world record cable tool mark of 10,132, hung up in 1949.

The postwar splurge of record-breaking that tapered off in the past year again served to emphasize the speed with which deep drilling techniques have been perfected. The first 10,000-foot hole was not drilled until 1931, which was 72 years after the birth of the industry. As the records now stand, wells in excess of 10,000 feet have been drilled in 31 of the 48 drilling areas of the U. S. Fifteen areas have had tests deeper than 15,000 feet, and three have been drilled below 20,000 feet.

Progress Indicated. Likewise indicative of the progress in deep drilling is that four of the nation's five deepest area depth records have been set since 1950. All but ten of the 48 regional records have been established since 1945.

The oldest regional record on the books was the 5022-foot hole drilled in New Jersey in 1928.

The present world record is the first for The Ohio Oil Company, which takes over a distinction held by The Superior Oil Company of California since 1947, when it drilled below 17,000 feet in Oklahoma. Superior followed with world depth records in California and Wyoming.

Drilling Depth Records in U. S., by States and Districts and by 1,000-Foot Intervals

STATE or DISTRICT	Feet	Year	WELL, LOCATION and REMARKS	Formation
California	21,482	1953	Ohio Oil Co.'s Kern County Lands "A" 72-4, Paloma field, Kern County, still drilling in late January, 1954	
Wyoming	20,521	1949	Superior Oil Company of California's Unit 1, Pacific Creek Area, Sublette County	U. Cretaceous
Mississippi	20,450	1952	George Vasen et al's Tung Oil Company of America 1, C SW NE 9-2s-11w, Stone County	
South Louisiana	18,660	1952	Magnolia Petroleum Company's Ragley Lumber Company, 1-D, C SW NW 29-5s-7w, Allen Parish	
Southwest Texas	17,966	1951	Superior Oil Company of California's Minnie S. Welder 27, Section 24, Portilla field, San Patricio County	
Oklahoma	17,823	1947	Superior Oil Company of California's Weller 51-11, Caddo County, in 11-8n-12w	Pennsylvanian
West Texas	16,696	1953	Gulf Oil Corporation and Jack Frost's P. G. Northrup et al 1, Section 33, Block 50, T-8, T&P Survey, Reeves County	
Upper Texas Coast	16,655	1945	Phillips Petroleum Company's Schoeps 3, Millican salt dome area, Brazos County	L. Cretaceous
New Mexico, Southeast	16,459	1953	Richardson and Bass' George H. Cobb-Federal 1, Section 23-20s-31e, Eddy County	Granite
East Texas	16,347	1949	Humble Oil and Refining Company's R. P. McWatters 1, Freestone County	Smackover
Lower Texas Coast	16,006	1947	The Texas Company's Yturria L & L Co. 6, Raymondville area, Willacy County	Frio
Alabama	15,729	1952	Humble Oil and Refining Company's Williams 1, Section 10-3n-2e, Clark County	Jurassic
Florida	15,455	1947	Gulf Refining Company's State of Florida 1, Big Pine Key area, Monroe County	L. Cretaceous
South Central Texas	15,301	1945	Quintana Petroleum Company's South Texas Syndicate 3-D, McMullen County	L. Cretaceous
Colorado	15,041	1951	Mountain Fuel Supply Co.'s Unit 1, Section 14-12n-100w, Hiawatha field, Moffat County	
North Louisiana	14,967	1947	Cotton Valley Operators Committee's A. G. Oliphant-Banks 2, Cotton Valley field, Webster Parish	Salt
North Texas	14,363	1953	Humble Oil and Refining Company's Mack Williams 1, Grayson County	
Texas Panhandle	14,278	1949	Gulf Oil Corporation's E. Porter "A"-1-E, Lipscomb County, Section 413, Block 43, H&TC Survey	Arbuckle
North Dakota	13,773	1952	Amerada's B. H. Risser 1, in 12-149n-96w, McKenzie County	Red River
Utah	13,766	1949	Pacific Western Oil Corporation and Equity Oil Company's Unit 1, 33-21s-21e, Grand County	Pennsylvanian
New Mexico, Northwest	13,248	1952	Continental Oil Company's Government 1, Rio Arriba County, SE SE SE 6-28n-2w	
Idaho	12,844	1951	Phillips Petroleum Company & Utah Southern Oil Company's Unit 1, NW SW SW 10-14s-30e, Oneida County	
Arkansas	12,650	1952	Shell Oil Company's Browning-Burns Unit 1, Columbia County	Smackover
Pennsylvania	12,321	1951	The California Company's Bennett 1, Davidson Township, Sullivan County	U. Silurian
Nevada	11,543	1952	Continental Oil Company's Unit 1, NW NW 32-20n-60e, White Pine County	Mississippian
Montana	11,519	1949	Shell Oil Company's Crow Tribal 7904-1, 36-9s-37e, Big Horn County	Cambrian
New York	11,145	1953	New York State Natural Gas Company's Kesselring 1, Van Etten Township, Cattaraugus County	
Michigan	11,012	1948	Ohio Oil Company Pure Oil Company's Reinhardt 1, West Branch field, Ogemaw County	Cambro-Ord.
Washington	11,002	1947	Standard Oil Company of California's Alderwood Comm. 1, Snohomish County	
North Carolina	10,054	1946	Standard Oil Company of New Jersey's Cape Hatteras 1, Dare County	Granite
West Virginia	10,018	1941	Hope Natural Gas Company's C. S. Gribble 2-8517, Grant District, Harrison County	Queenston
Virginia	9,936	1949	The California Company's Kipps Anthracite Coal Company 1, Montgomery County	Ordovician
South Dakota	9,348	1951	Shell Oil Company's J. T. Homme 1, 13-20n-12e, Perkins County	Granite
Oregon	9,263	1946	The Texas Company's Cooper Mountain 1, Washington County	
Kansas	8,243	1947	Stanolind Oil & Gas Company's Feathers 1, 15-35s-33w, Seward County	Arbuckle
Maryland	8,165	1941	William Snee's Schartzer 1, Accident District, Garrett County	Helderburg
Nebraska	7,998	1951	Gulf Oil Corporation's Nels Miller 1, C SW SW 7-12n-58w, Kimball County	Morrison
North Central Texas	7,980	1945	Humble Oil and Refining Company's C. H. Tompkins 1, T&P Railway Survey 169, Parker County	Ellenburger
Ohio	7,889	1933	Benedum and Trees' Knowlton 1, Independence Township, Washington County	Clinton
Illinois	7,682	1952	Superior Oil Company's H. C. Ford et al C-17, C SW SE 27-4s-14w, White County	Shakopee lime
Georgia	7,490	1944	Stanolind Oil & Gas Company's J. H. Pullen 1, Mitchell County	Cretaceous
Arizona	7,211	1952	Sinclair Oil & Gas Company's Navajo 1, Navajo County	Granite
Kentucky	6,686	1949	Pure-Ashland-I. B. Browning's M. L. Walker 1, 22-N-24, Webster County	Knox
Indiana	6,408	1946	Continental Oil Company's Cooper 1-D, Griffin field, Gibson County	Trenton
Tennessee	5,750	1947	The California Company's E. W. Beeler 1, Section 4-15s-29e, Giles County	Granite
Iowa	5,305	1930	Oil Development Company's Wilson 1, Page County	Cambrian
New Jersey	5,022	1928	W & K Oil Company's Well 1, Jackson Mills area, Ocean County	Granite
Missouri	4,740	1941	Strake Petroleum Company's T. P. Russell 1, Pemiscot County	Cambrian

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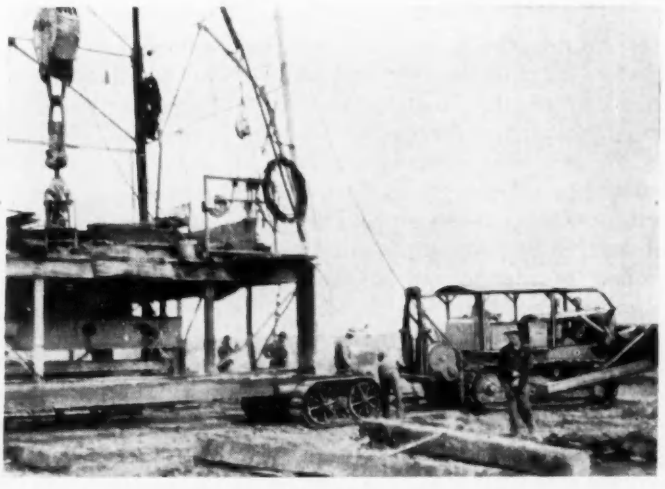
This HD-15 Tractor Shovel is a tool which introduced a new era of tractor usefulness . . . let contractors move from job to job easily and do traditional jobs in a better, faster way.



The improvements and refinements of this really modern design take on new significance as competition gets keener. Extra jobs handled . . . or lubrication time saved means working more efficiently, more profitably.

WORLD OIL'S

10 BEST DRILLING HINTS

.... published in 1953

These hints, chosen from WORLD OIL's Drilling Hints published in 1953, were selected by a panel of experts as the ten best of the year. The panel was composed of 2 drilling superintendents of major companies, 2 vice presidents of drilling companies, a drilling company president, and 2 engineers.

Handle Device Facilitates Mud Gun Jetting Direction

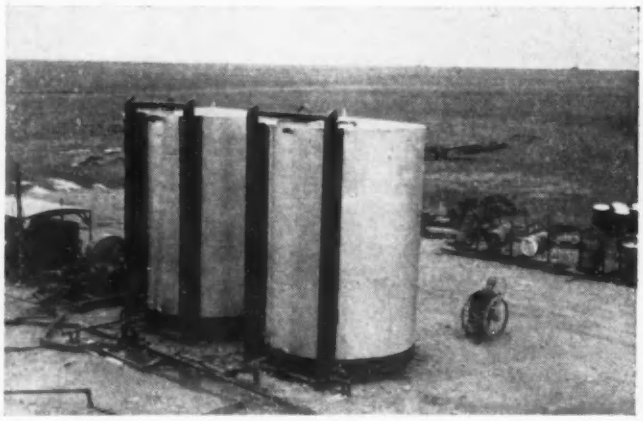
A drilling barge operating in the Gulf is equipped with an interesting homemade device which is quite useful in a permanent mud system. On recently designed barges submersible type mud guns are used in conjunction with, or as an auxiliary to, impeller type mud agitators.

The photograph shows how the jet may be directed in any of five positions. The steel handle indicates the direction of the submersed jetting, and by changing the handle position to any of the five slots indicated, the sumbersed jet changes its direction of jetting. This provides an easy method of determining where the gun is controlled at the bottom of the tank, offering better agitation.

The "jet director" is made by cutting a four to five inch width of six-inch pipe which is welded on a flat one-quarter-inch steel plate. Slots are cut at 45 degree intervals around the circumference of the pipe, forming the locking mechanism when the handle is fitted into its recess.

Appropriate holes are bored in the plate to bolt the apparatus in place.

Tanks on Skids Can Be Moved Easily



Fresh water tanks at a rig in New Mexico are equipped on one side with twin skids which are welded to similar material attached to the bottom of the tanks. With the skids in place the water tanks can be loaded and unloaded easily. Both the skids and foundation sections are "I" beam steel welded to the tank. Bearing plates are inserted between the thin walls of the tanks and the heavy structural steel at the beginning of the welding operation.

The upper ends of the skids are of the conventional sled runner type, and are joined with a tow-bar. To load the tank on the transport truck the winch line is attached to the bar and the tank is skidded upon the flat bed in horizontal position. In unloading, the operation is reversed. As the tank meets the ground it is tipped to a vertical position.

Steel Frame Groups Preventer Wheels

Blowout preventers installed in a businesslike manner so that they can be checked every tour make for safer operation. Unitized valve wheels are plainly marked and grouped so that they are always in the same position and can be easily reached from the stairway to the rig floor or the foot of the ramp.

The main part of the assembly is a triangular pipe frame welded from two-inch pipe with tee shaped ends for a base which allows the stand to remain erect. The saddle for ram No. 1 is a two-inch short nipple welded horizontally at the apex of the triangular frame. Ram No. 2 is placed in a two-inch collar welded to the right side of the triangle midway between the apex and the base. The master

valve is attached to the left side of the support in the same manner.

The assembly is painted red and all three valve wheels are labeled plainly. This arrangement makes it easy for each tour to check and keep in perfect working order, assuring proper function at the time of emergency.

when it comes to

strength

...any *HCSmith* bit is the right choice!

Right—because both 3-Cutter and 4-Cutter Bits are *all-forged*—tough steel throughout, forged for controlled grain-flow, heat-treated for maximum strength, with cutter teeth hard-faced with tungsten carbide for extra-long digging life. You can't buy a stronger bit!

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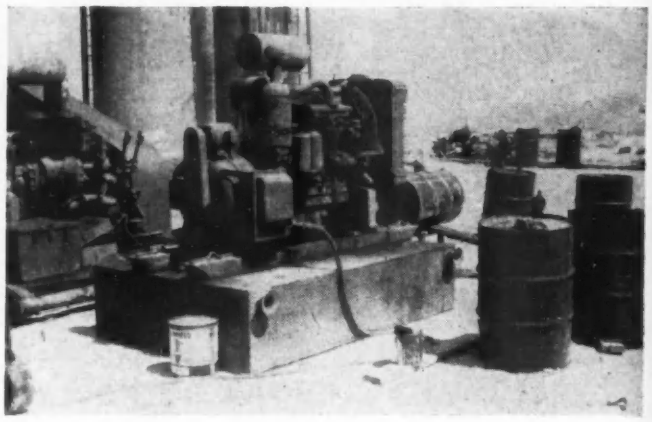
Generator Unitized with Fuel Tank



Unitizing the electric generating plant with its individual fuel tank has been accomplished by Miller & York, Bakersfield, Calif. The generator plant can be operated up to nine days without refilling the 480-gallon fuel storage tank which rests beneath the equipment supplying source of illumination.

The sills supporting the generating plant are attached solidly to the top of the fuel tank, and are equipped with rings, or bails into which bridles can be inserted for lifting with a motor crane when moving. In addition to these lifting devices, flanged spools are attached to each of the four corners so that a different method of moving can be used when necessary. This self-sufficient generator can be set at any convenient point at the rig, regardless of the location of the principal fuel tank which supplies the mud pump and drilling engines.

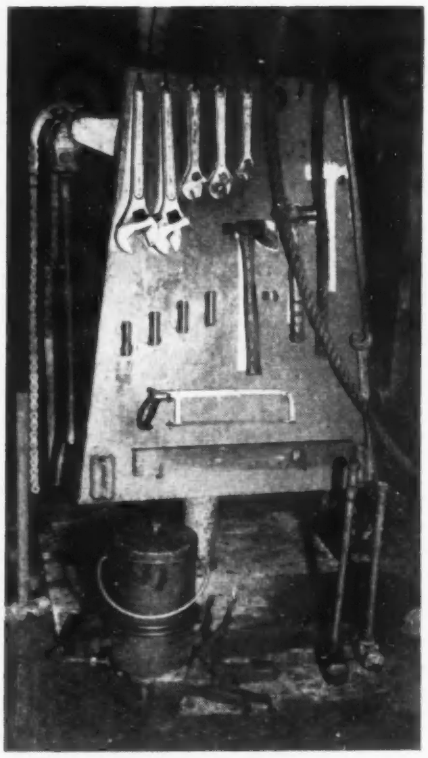
Washdown Pump Run Off Flywheel

There are many elaborate ways to connect up a washdown pump but the simplest scheme is to place the pump on the engine compounding unit housing and run the pump off a gear on the flywheel of the engine.

The pump is placed on a stand constructed so as to allow the pump to slide back and forth on the stand to adjust the belt tightness. After the pump is installed on this stand it is connected to a power take-off pulley furnished by the engine manufacturer.

The inlet on the side of the pump is connected to the fresh water supply and the outlet bushed down. A valve and nipple are installed with a washdown hose added. Once this installation is made, no further attention is needed.

When the water pressure is called for on the derrick floor or elsewhere, the valve is opened and the hose used. As soon as the hose is not needed, the valve is closed against the centrifugal pump. Centrifugal pump pressure is increased to approximately 30 psi., but no damage is incurred by the pump and the added drag on the engine is not noticeable. If the pump is to be out of service for a long period, the belt is thrown off.



Rotating Tool Box Conserves Space

A rotating-type tool box which makes for good housekeeping on the derrick floor and considerable savings in time and tool replacements has been developed. Compact and convenient, it requires few materials for construction and occupies only a minimum amount of space for easy handling and hauling between locations.

This portable and maneuverable tool box is about 5 feet high with a 48-inch square base. The four sloping sides have been designed to handle all tools common to any drilling rig. Hooks are provided for crescent and other type wrenches so that they may be suspended by the handles. Their proper positions have been indicated by paintings on the exterior so that the tool pusher can tell at a glance when a tool is missing. One of the sides has a door opening into four interior shelves, which are used to store small pieces of easily lost equipment.

The box is built of ¼-inch steel sheets and scrap pipe. It is supported by a pipe trunk which is welded to a christmas tree-like base. The shelves are welded around the trunk pipe. The square base plate is constructed of ½-inch steel which has been cut the same size as the bottom of the tool box to provide a stable base to support the revolving unit above. By adding rollers to the base plate, the box can be rolled to any piece of drilling equipment where it is needed.

The revolving mechanism is made by placing 3-inch pipe inside of the 4-inch trunk, allowing it to rest on a ball bearing race at the top.

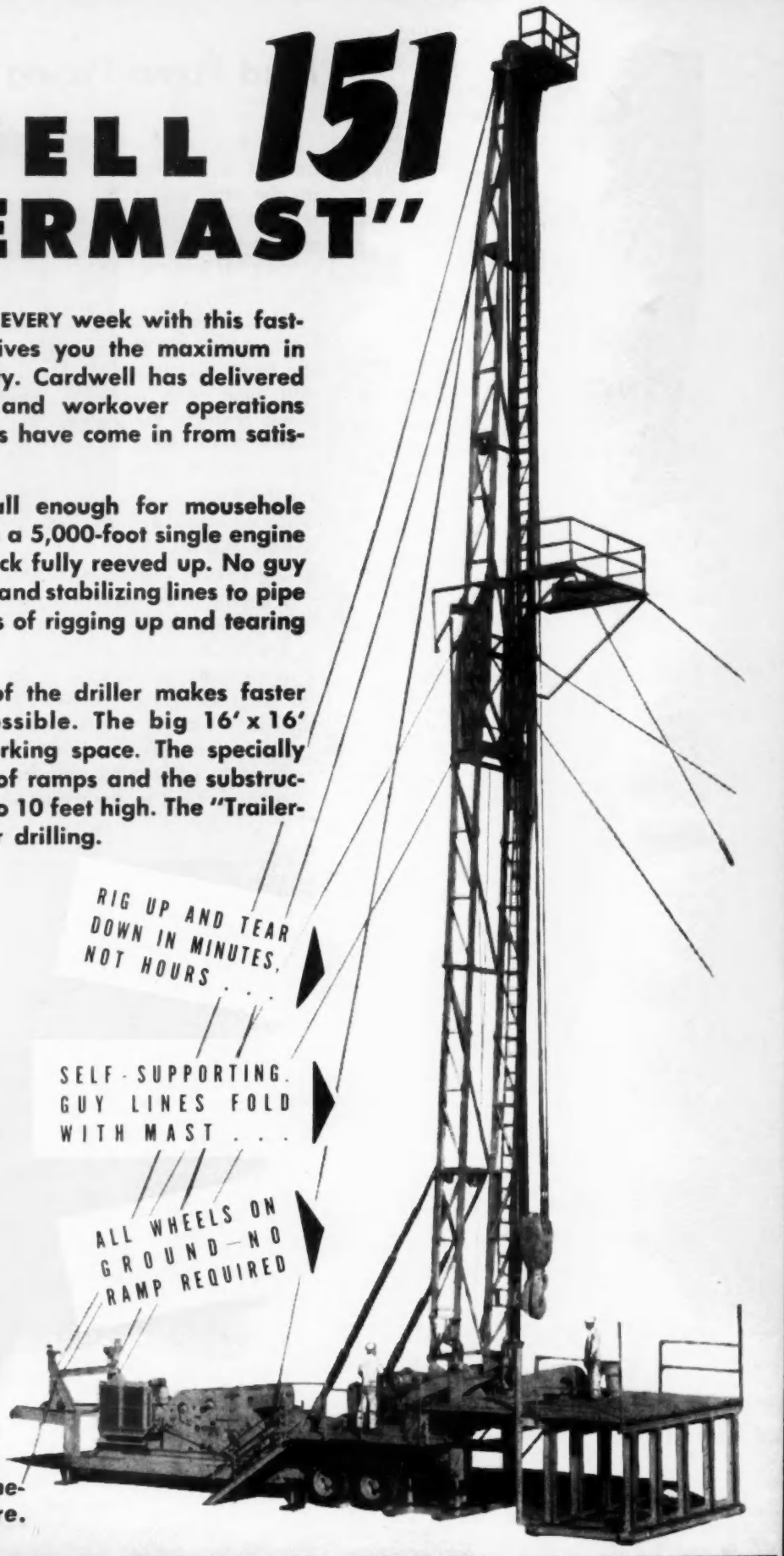
The New CARDWELL 151 "TRAILERMAST"

GAIN an extra day's drilling EVERY week with this fast-moving Cardwell "Trailermast." Gives you the maximum in portability, rig-up speed, and safety. Cardwell has delivered 44 of this type rigs for drilling and workover operations throughout the world. Repeat orders have come in from satisfied owners.

This 96-foot "Trailermast" (tall enough for mousehole connections) is moved complete with a 5,000-foot single engine draw works, and with mast and block fully reeved up. No guy lines are required except wind lines and stabilizing lines to pipe rack. This means you can save hours of rigging up and tearing down on every well.

Note the unobstructive view of the driller makes faster operation and greater safety possible. The big 16' x 16' "derrick" floor provides ample working space. The specially designed trailer eliminates the use of ramps and the substructure permits blowout preventers up to 10 feet high. The "Trailermast" can be used for workover or drilling.

150,000# with eight lines up.



The Cardwell 151 "Trailermast" is 8 feet wide, has 12'-6" road height, and 57'-3" road length. Total weight with double drum Model L draw works is 59,380#.

NOTE: ***Portable, One-Piece Substructure.***

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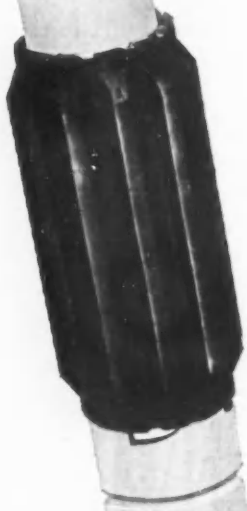
• **BETTER** — The large area wall contact with hole more effectively centers and cushions the drill collars.



• **SAFE** — Can be easily washed over. Simplified seamless one-piece construction.

• **INEXPENSIVE** — In hard formations a single sleeve may last as long as 600 rotating hours.

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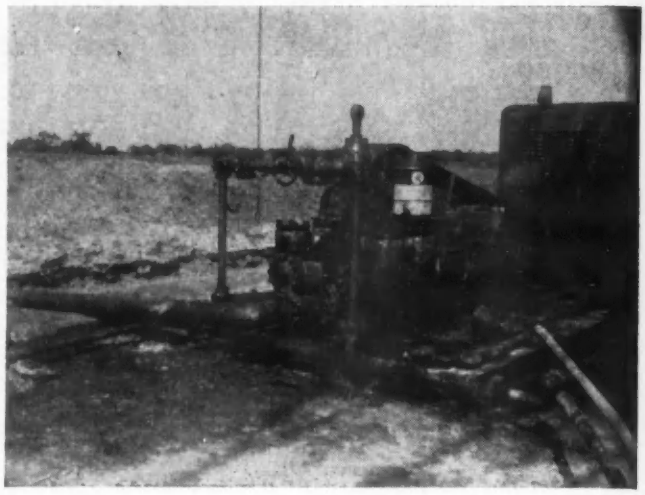
Mud Pump Piping Can Be Simplified

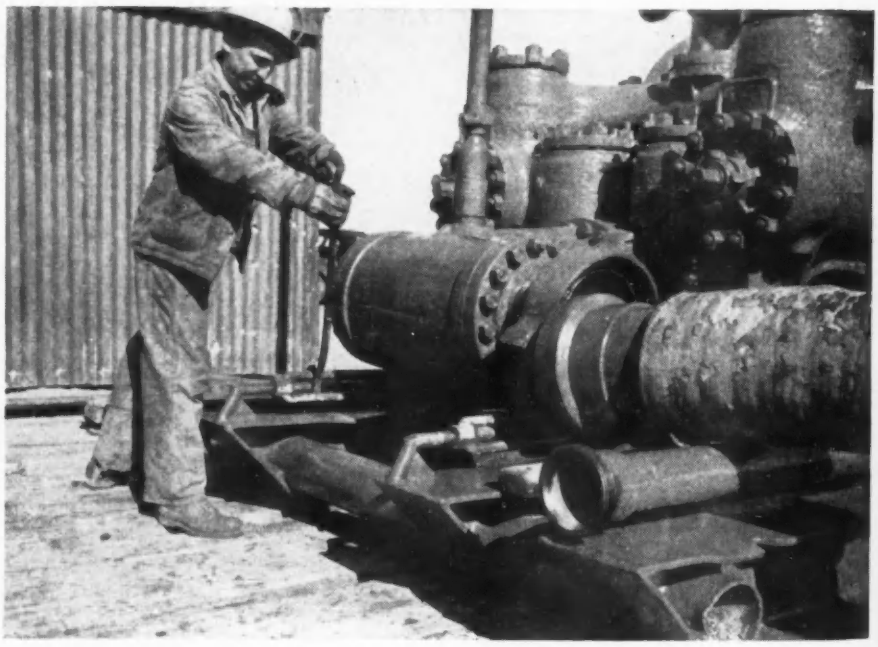


This simple method of hooking up the mud pump with a manifold will save time on rigging up and rigging down.

Weld a four-inch piece of pipe across the front of pump skid base with a blank plate in the middle. This piece forms the strength for the front of the pumping unit, and carries two quick-acting unions, one on each end.

Then union up the pump discharge to either side of the blanked off place in the header with a valve on each side. In operation, as soon as the unit has been spotted at the well site, the mud line from the rotary hose is connected to the union shown at the right in the foreground, and the other union is hooked to the casing side of the well in workover rigs and to the jetting lines in normal drilling.

Also shown, is the half of the quick-acting union used on the suction to connect to the water line when drilling is first commenced and also for compounding with another pump when it is necessary to break down the formation or when it is necessary to kill a well.



Turnbuckles Used to Adjust Belt Tension

Keeping proper belt tension on mud pumps, an old problem in spotting pumps, has been solved by the use of guy wire turnbuckles welded to the front of the pump.

Mount the pump on skids in the usual manner with adjustment slots so that the pump can be moved back and forth. Center and measure turnbuckles on the skid and adjust so

Plan the strap pays, too . . .

Hunting a shrinking target
at greater depths and higher costs?

Drill with both eyes open!

Core Lab's Well Logging Service,
in combination with On-Location Core
Analysis, not only minimizes the coring
of non-productive horizons and
establishes proper coring points at the
major objective . . . but also pinpoints
stray pays as they are encountered.

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is sprinkled with stray pay fields.

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CORE LAB
WELL LOGGING SERVICE

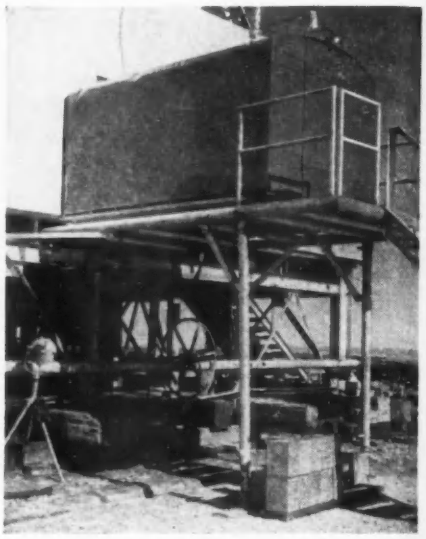
they run free. Cut end eyes off and bend to base using 45 degree weld. These ends are welded to the side of the pump frame and to the top of the skid.

Pumps are spotted at well locations and jacks are used to hold the pump in the approximate position until the turnbuckles are loosened enough for the belts to be slipped on the sheaves. Tighten the turnbuckles until the belts are at their proper tightness. Constant check should be made to keep proper adjustment.

Increased belt and bearing life has resulted from this simple rig and it has minimized the power drop between engines and the pumps.

Collapsible Support for Doghouse Aids Moves

In an area where derricks are skidded from one location to another, instead of being dismantled, the doghouse support is built with a hinged connection to the side sills so it can be folded upward against the structure. The support is built with sturdy pipe side rails, end pieces and the necessary number of cross connecting members. Heavy single pin hinges attached to the ends of the side members and the sill of the derrick form means of permanent connection.



The supporting posts for the outer ends of the side members are also attached with simple single pin hinges, but contain two sway braces, all of which are attached with bolts passing through matching holes in lugs on the posts and on the side members of the doghouse support. When the hole has been completed, the doghouse is moved away as a unit, leaving the supporting structure attached to the derrick. Bolts are removed from the sway braces at the outer end, and the derrick line employed to lift the support against the derrick where it is secured with adequate clamps.

Telescoping legs provide convenience in rough terrain, offering a horizontal support for the doghouse. The steel stairs may be readily fastened or removed from the end support.

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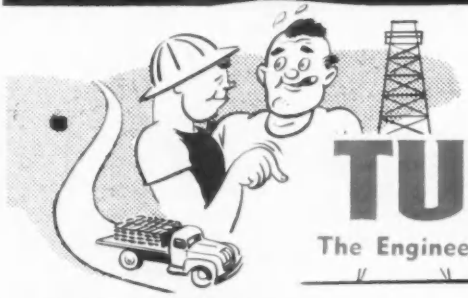
USE



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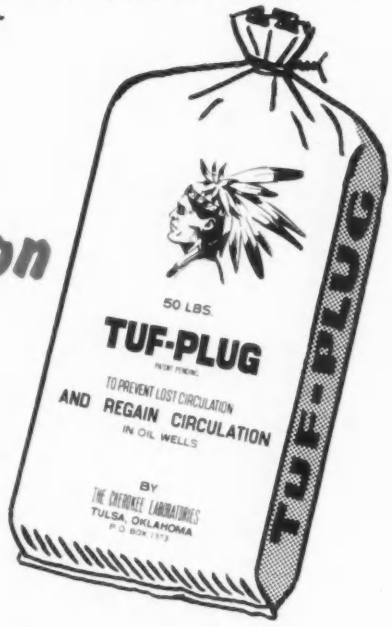

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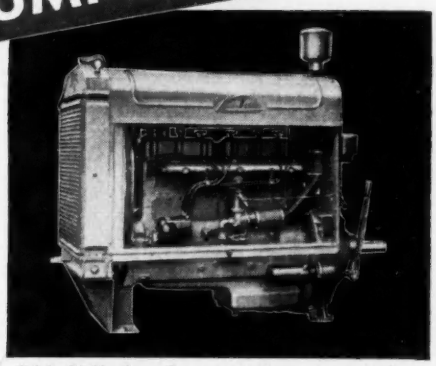
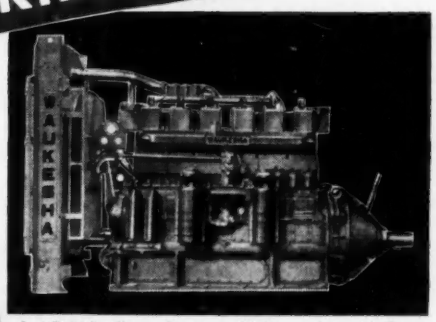


145-GKU Gas Power Unit — six cylinders, 5¼-in. bore x 6-in. stroke, 779 cu. in. displ., 145 hp at 1600 rpm on natural gas.

DRILLING



6-LROU Gas Power Unit — six cylinders, 8½-in. bore x 8½-in. stroke, 2894 cu. in. displ., 361 hp at 1000 rpm on natural gas.

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It gives complete line of Waukesha Oil Field Engines for gas, gasoline, normal Diesel, or turbocharged Diesel operation—to 570 hp.

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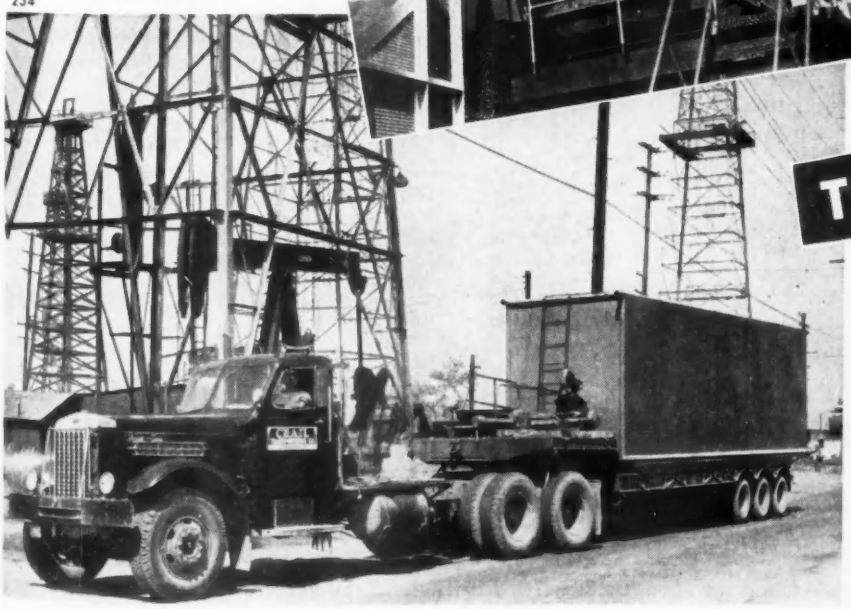
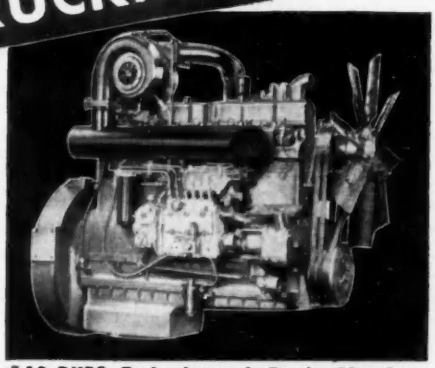


TRUCKING



148-DKBS Turbocharged Truck Diesel — six cylinders, 5¼-in. bore x 6-in. stroke, 779 cu. in. displ., 280 hp at 2100 rpm.

Fuel Tank-Toolhouse Saves Transportation Cost

Make a unitized fuel oil storage tank, lube oil dispenser and toolhouse and save on transportation costs. Contractors using this assembly will be interested in the feature that it furnishes a base to elevate the fuel oil tank so that fuel will flow by gravity to the engines.

This equipment was developed for use in the mountains where the transportation is always difficult. Notice that both the top and bottom sections of this assembly are skid-mounted for easy loading and unloading. The bottom section which contains the lube oil tanks, hand pumps and the toolhouse is made of light grade sheet metal installed in a frame made from two-inch pipe. Inside the toolhouse there are the usual racks and benches used for storing hand tools, so necessary in maintaining the rig. The upper section, which is the fuel oil tank, is mounted on a frame made from steel plate and I-beam as shown in the photo.

Detachable ladders, fabricated from scrap pipe, can be bolted to the structural members of the upper and lower sections to aid workmen in carrying on duties of refueling and rig maintenance.

Another feature is the steel guide welded to the top supporting member of the lower section, for sliding the upper section in place.

Always UP TO THE MINUTE and DOWN TO THE FOOT!

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Artificial Lift . . . 23,181 oil producing wells in U. S. will be put on artificial lift for the first time during 1954.

A TOTAL OF 23,181 oil producing wells in the U. S. will be put on some form of artificial lift for the first time in 1954. This is just 124 wells less than the 23,305 wells placed in this category during 1953, which was an all-time record for the industry.

This number includes new wells to be completed that must be produced by artificial lifts immediately, plus old wells which formerly flowed naturally, but have reached that stage in their productive life when fluids must be lifted to the surface by artificial means. These figures do not include former pumping wells which are shut in and will be opened up again during the year, but include only those wells put on artificial lift for the first time.

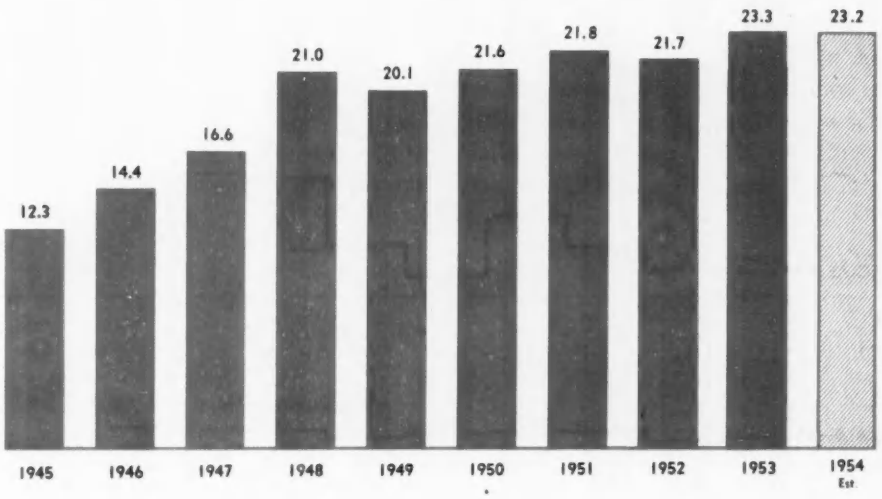
Texas leads the U. S. in wells to go on artificial lift with a total of almost 9000. Highest contributing area in the state is North Texas, Districts 7-B and 9, where 3251 wells will go on artificial lift this year. In this area is located the largest concentration of artificial lift wells in the state, totaling 31,850 wells.

The relatively large number of wells forecast for artificial lift in this region is predicated on a large drilling program for this year, during which time it is expected that a total of nearly 7000 wells will be drilled. West Texas will contribute about 2490 wells to the artificial lift column. Remainder of Texas will show little change in the trend to artificial lift wells. Oklahoma is second in the U. S. for wells in this category with 3760 wells forecast for artificial lift in 1954. This is 14 less wells than the number which were put on artificial lift last year.

There were 442,353 wells on some form of artificial lift at the beginning of 1954, another record for the industry, compared with 431,533 such wells a year ago. This is a net gain of 10,820 wells. This gain was made in spite of the fact that 12,478 wells were shut in or abandoned.

TRENDS IN WELLS PUT ON ARTIFICIAL LIFT

(THOUSANDS OF WELLS)

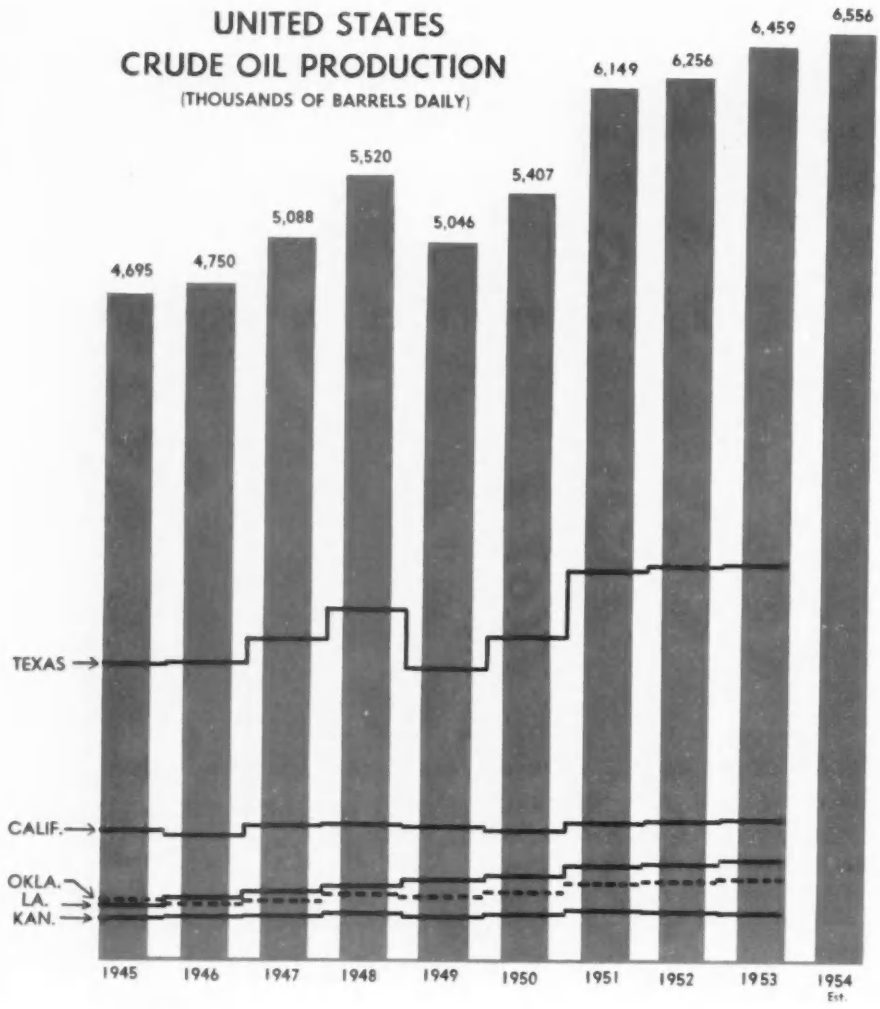


Estimate of 1954 Artificial Lifting Equipment Needs

(Includes requirements for all types of pumping, hydraulic power, and gas lift units.)

STATE or DISTRICT	Est. Wells to go on Art. Lift in 1954	Wells Put on Pump or Lift in 1953	New Oil Wells Completed in 1953	No. Flowing Oil Wells End of 1953	Oil Wells on Artificial Lift End of 1953	Net Wells Shut in or Abandoned in 1953	Est. Maintenance Cost for All Art. Lift Wells in 1954 (Equipment Only)
Alabama	8	18	16	2	110	.....	$ 11,058
Arkansas	278	287	273	336	3,699	166	464,398
California	1,773	1,919	1,887	1,834	29,950	974	12,334,800
*Colorado	223	201	248	132	1,098	—11	183,920
Illinois	1,190	1,071	1,069	5	34,417	381	3,712,332
Indiana	506	490	477	9	4,825	138	492,566
Kansas	1,957	2,057	2,041	42	33,272	.....	4,138,321
Kentucky	450	517	517	.....	16,234	.....	1,744,654
Louisiana	790	676	1,439	4,354	8,583	863	1,268,576
North Louisiana	296	292	679	811	6,496	663	843,788
South Louisiana	494	384	760	3,543	2,087	200	424,788
Michigan	285	255	244	123	3,863	250	532,798
*Mississippi	25	22	123	307	1,536	—10	298,957
Montana	175	171	192	51	3,421	36	533,368
Nebraska	117	122	120	.....	302	41	61,370
*New Mexico	385	403	585	3,644	3,606	—62	1,139,700
New York	506	566	566	.....	23,000	566	1,278,915
North Dakota	49	59	170	179	73	3	10,780
Ohio	410	423	453	70	19,400	433	1,176,300
Oklahoma	3,760	3,774	4,409	2,120	60,956	1,580	7,603,156
Pennsylvania	549	724	724	.....	80,500	1,424	4,039,000
Texas	8,949	8,843	9,035	45,976	94,884	4,574	18,459,029
Dist. 1: South Central	420	440	441	340	4,110	106	656,640
Dist. 2: Middle Gulf	330	303	272	3,246	1,674	145	323,664
Dist. 3: Upper Gulf	900	804	777	5,080	6,080	601	992,560
Dist. 4: Lower Gulf-S.W.	480	513	804	5,375	6,185	528	1,085,825
Dist. 5 & 6: E. Cent. & N.E.	676	651	241	12,785	13,555	473	3,056,460
Dist. 7-B & 9: N. Cent. & N.	3,251	3,261	3,556	3,650	31,850	1,701	4,618,220
Dist. 7-C & 8: W. Cent. & W.	2,490	2,556	2,574	15,410	23,310	863	6,460,868
Dist. 10: Panhandle	402	315	370	90	8,120	157	1,264,792
Utah	25	25	18	3	66	10	9,559
West Virginia	78	73	73	.....	13,600	673	791,062
Wyoming	663	576	612	278	4,841	349	786,296
†Other States	30	33	32	1	157	17	19,171
Total United States	23,181	23,305	25,323	59,466	442,353	12,478	61,090,086

* Showed no net abandonments, due to inactive wells put back on production.
† Florida, Mississippi, Tennessee and Virginia.



U. S. Crude Production . . . slight increase over 1953 output is indicated.

U. S. PRODUCERS of crude oil have a fairly encouraging outlook for 1954. They will be called on to produce a little more oil than in 1953, if expected higher demand for petroleum products materializes. And they will get more per barrel for their crude, on the average, if present postings hold, as the price raise of about 25 cents in 1953 came at the middle of that year. The prospective larger production and better price would mean more revenue for covering high development costs and taking care of needed expansion of operations.

The predicted production of 6,556,000 barrels daily in 1954 would be 97,000 barrels or 1.5 percent more than the output of 6,459,000 daily in 1953. This prospective increase would extend the traditional rising trend, following 1953's gain of 203,000 barrels daily or 3.2 percent over 1952. The output last year averaged 6,459,000 barrels daily, compared with 6,256,000 a day in 1952.

The prospective production of about 2,393,000,000 barrels of crude oil in the U. S. in 1954 would have a value of $6,652,540,000 at the wells, at current prices, averaging about $2.78 per barrel. This amount of revenue would exceed by $358,065,000 or 5.7 percent the indicated $6,294,475,000 received by U. S. producers for their crude output in 1953. The 1953 revenue had been $509,245,000 or 8.8 percent more than the $5,785,230,000 received for 1952 production.

Crude produced between January 1 and June 15, 1953, was purchased at prices averaging $2.53 per barrel, and that produced during the remainder of the year was bought for about $2.78 per barrel on the average. The market value of the whole year's production at the wells represented an average of about $2.67 per barrel. The early 1954 average price of $2.78 per barrel was 4.1 percent more than the $2.67 average of 1953, which was 5.5 percent better than the $2.53 average of 1952.

The prospect of a year of good business for U. S. crude producers in 1954 is based on expectations of a further increase of about 4 percent in demand for petroleum, practically the same gain as in 1953 over 1952. The Bureau of Mines has forecast a market for 8,340,000 barrels per day of all oils in 1954, an increase of 317,000 barrels daily or 3.9 percent over 1953. The demand was 8,023,000 daily in 1953, up 311,000 daily or 4.0 percent over 1952.

The previously mentioned forecast of an increase of 97,000 barrels daily or 1.5 percent in required domestic crude production in 1954 is smaller than the prospective 3.9 percent gain in total demand for all oils because of several factors, as follows:

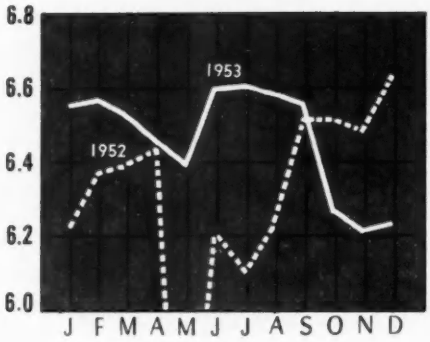
1. Domestic production of natural gasoline and other oils will increase by 45,000 barrels daily or 6.7 percent, rising to 710,000 barrels daily from 665,000 a day last year, it is forecast. This will be a relatively larger increase than that for crude oil. The production of those light products in 1953 showed an increase of 53,000 barrels a day or 8.7 percent over 1952. Actually, many crude oil producers also produce the gas or gas-condensate that yields natural gasoline, and they will benefit from the expected gain in natural gasoline production.

2. The estimate of required crude production in 1954 is held down by the fact that the Bureau of Mines forecast allows for a net increase of

only 8 million barrels in 1954 in the stocks of all oils. This would all be in refined products, as no net change in crude stocks is considered essential. In contrast, the industry in 1953 produced substantially more crude oil and refined products than necessary to meet market demand, and consequently increased above-ground storage of all oils by over 50 million barrels, an average of 139,000 barrels daily. Crude stocks were practically the same at the end of 1953 as at the beginning, but stocks of refined products were up over 46 million barrels, and those of natural gasoline were over 4 million barrels higher.

3. Finally, required U. S. crude production in 1954 will be held down to some extent by a prospective further increase in imports. The predicted total imports averaging 1,096,000 barrels per day in 1954 would be 58,000 barrels a day or 5.6 percent above those in 1953. The total imports of 1,038,000 barrels daily in 1953 were 86,000 barrels a day or 9.0 percent above 1952. For 1954 crude oil imports are estimated by the Bureau of Mines at 685,000 barrels daily, up 41,000 daily or 6.3 percent over 1953. The crude imports in 1953, averaging 644,000 barrels daily, were 71,000 a day or 12.4 percent over 1952. It is controversial whether or not imports of residual fuel oil and other products displace domestic crude. The imports of refined products in 1954 will average 411,000 barrels daily, up 17,000 a day or 4.4 percent over 1953. The receipts in 1953, amounting to 394,000 barrels daily, were above 1952 by 15,000 daily or 3.9 percent.

U. S. CRUDE PRODUCTION
(Millions of Barrels Daily)



U. S. Crude Production, by States, 1952, 1953, and Cumulative

From U. S. Bureau of Mines, except November and December, 1953, estimated from A.P.I. weekly reports, and breakdown of Louisiana and Texas by districts based on various sources.

(THOUSANDS OF BARRELS)

STATE or DISTRICT	PRODUCTION DURING YEAR						CUM. THRU 1953	
	TOTAL		DAILY AVERAGE			1953 As Percent of U.S.	Thousand Barrels	Cum. As Percent of U.S.
	1952	1953	1952	1953	% Diff. '52-'53			
Alabama	1,279	1,705	3.5	4.7	+ 33.4	0.07	6,677	0.01
Arkansas	29,440	29,608	80.4	81.1	+ 0.9	1.25	884,948	1.85
California	359,450	365,021	982.1	1,000.1	+ 1.8	15.49	9,698,630	20.28
Colorado	30,381	33,275	83.0	91.2	+ 9.9	1.41	238,489	0.50
Florida	591	540	1.6	1.5	— 6.3	0.02	3,307	0.01
Illinois	60,089	58,976	164.2	161.6	— 1.6	2.50	1,685,624	3.52
Indiana	12,037	13,039	32.9	35.7	+ 8.5	0.56	236,899	0.50
Kansas	114,807	114,198	313.7	312.9	— 0.3	4.84	2,443,050	5.11
Kentucky	11,918	11,565	32.6	31.7	— 2.8	0.49	287,351	0.60
*Louisiana	243,929	254,624	666.5	697.6	+ 4.7	10.80	3,291,850	6.89
North Louisiana	43,910	41,332	120.0	113.2	— 5.7	1.75	918,464	1.94
South Louisiana	200,019	213,292	546.5	584.4	+ 6.9	8.97	2,043,178	4.31
Michigan	13,251	12,316	36.2	33.7	— 6.9	0.52	361,741	0.75
Mississippi	36,310	35,383	99.2	96.9	— 2.3	1.50	392,791	0.82
Missouri	21	22	0.1	0.1		0.01	645	0.00
Montana	9,606	11,748	26.2	32.2	+ 22.9	0.49	198,563	0.42
Nebraska	2,660	5,929	7.3	16.2	+121.9	0.26	18,531	0.04
New Mexico	58,681	70,513	160.3	193.2	+ 20.5	2.99	864,308	1.81
New York	4,242	3,907	11.6	9.7	— 16.4	0.15	189,414	0.39
North Dakota	1,549	5,108	4.2	14.0	+233.3	0.21	6,682	0.02
Ohio	3,350	3,555	9.1	9.7	+ 6.6	0.36	631,044	1.32
Oklahoma	190,435	202,821	520.3	555.7	+ 6.8	8.61	6,841,589	14.31
Pennsylvania	11,233	10,554	30.7	29.9	— 2.7	0.46	1,158,295	2.42
Tennessee	15	12	0.0	0.0		0.00	545	0.00
*Texas	1,022,139	1,023,754	2,792.7	2,804.8	+ 0.4	43.43	16,779,022	35.09
Dist. 1: South Central	12,595	13,779	34.4	37.7	+ 9.6	0.58	326,019	0.69
Dist. 2: Middle Gulf	59,118	56,792	161.5	155.6	— 3.7	2.40	730,965	1.54
Dist. 3: Upper Gulf	175,076	171,238	478.3	469.1	— 1.9	7.22	3,146,942	6.65
Dist. 4: L. Gulf-S.W.	95,229	94,974	260.2	260.2		4.02	1,209,129	2.56
Dist. 5: East Central	19,906	17,774	54.4	48.7	— 10.5	0.75	567,320	1.19
Dist. 6: Northeast	142,986	137,219	390.7	375.9	— 3.8	5.82	3,006,531	6.35
Dist. 7-B: N. Central	35,291	41,584	96.4	113.9	+ 18.2	1.77	593,179	1.26
Dist. 7-C: W. Central	55,109	60,422	150.6	165.5	+ 9.9	2.58	408,210	0.86
Dist. 8: West	346,969	326,685	948.0	895.0	— 5.6	3.89	3,428,863	7.24
Dist. 9: North	61,946	66,637	169.3	182.6	+ 7.9	2.83	1,299,668	2.75
Dist. 10: Panhandle	29,929	27,571	81.8	75.5	— 7.8	1.17	759,454	1.60
Utah	1,737	1,804	4.7	4.9	+ 4.3	0.07	6,722	0.02
Virginia	10	15	0.0	0.0	+ 50.0	0.00	228	0.00
West Virginia	2,602	3,021	7.1	8.3	+ 16.9	0.13	449,340	0.94
Wyoming	68,074	84,468	186.0	231.4	+ 24.4	3.59	1,137,269	2.37
Unclassified							572	0.01
Total United States	2,289,836	2,357,481	6,256.4	6,458.8	+ 3.2	100.00	47,814,116	100.00

*Data on Louisiana and Texas by districts are from various sources and do not agree with state totals, which are on Bureau of Mines basis.

See Page 148 for crude production by states and years.

U. S. Crude Oil Production

Source: U. S. Bureau of Mines, except Nov. and Dec., 1953, from American Petroleum Institute.

(THOUSANDS OF BARRELS)

Year	Total	Daily	Year	Total	Daily
			1936	1,099,687	3,013
			1937	1,279,160	3,505
1918	355,928	975	1938	1,214,355	3,327
1919	378,367	1,037	1939	1,264,962	3,466
1920	442,929	1,213	1940	1,353,214	3,707
1921	472,183	1,294	1941	1,402,228	3,842
1922	557,531	1,528	1942	1,386,645	3,799
1923	732,407	2,007	1943	1,505,613	4,125
1924	713,940	1,956	1944	1,677,904	4,584
1925	763,743	2,092	1945	1,713,655	4,695
1926	770,874	2,112	1946	1,733,939	4,750
1927	901,129	2,469	1947	1,856,987	5,088
1928	901,474	2,469	1948	2,020,185	5,520
1929	1,007,323	2,760	1949	1,841,940	5,046
1930	898,011	2,460	1950	1,973,574	5,407
1931	851,081	2,332	1951	2,247,711	6,158
1932	785,159	2,151	1952	2,289,836	6,256
1933	905,656	2,481	1953	2,357,481	6,459
1934	908,065	2,488	1954		
1935	996,596	2,730	Est.	2,393,000	6,556

United States Crude Oil Production, By States, By Years (Part 1)

Data in thousands of barrels; from *Mineral Resources and Minerals Yearbook*, except where otherwise indicated in footnotes.

Year	Alabama	Arkansas	California	Colorado	Florida	Illinois	Indiana	Kansas	Kentucky	Louisiana	Michigan	Mississippi	Missouri	Montana	Nebraska	New Mexico
1875									E							
1876			12													
1877			13						G E							
1878			15						G E							
1879			20						G E							
1880			40						G E							
1881			100						G E							
1882			129						G E							
1883			143						G5							
1884			262						G4							
1885			325						G5							
1886			377						G5							
1887			678	76					G5							
1888			690	298					G5							
1889			303	317					G5							
1890			307	369		1	33	1	G6				H			
1891			324	666		1	137	1	G9				H			
1892			385	824		1	698	5	G7				H			
1893			470	594		1	2,335	18	G3				H			
1894			706	516		H	3,689	40	G2				H			
1895			1,209	438		H	4,386	44	G2				H			
1896			1,253	361		H	4,681	114	G2				H			
1897			1,903	385		1	4,122	81	G H				H			
1898			2,257	444		H	3,731	72	G6				H			
1899			2,642	390		H	3,848	70	G18				H			
1900			4,325	317		H	4,874	75	G62		J		J2			
1901			8,787	461		H	5,757	179	G137		J		J2			
1902			13,984	397		H	7,481	332	G185	549	J		J1			
1903			24,382	484			9,186	932	G554	918	J		J3			
1904			29,649	501			11,339	4,251	G998	2,959	J		J3			
1905			33,428	376		181	10,964	I3,750	G1,217	8,910	J		J3			
1906			33,099	328		4,397	7,674	I3,627	G1,214	9,077	J		J3			
1907			39,748	332		24,282	5,128	2,410	G821	5,000	J		J4			
1908			44,855	380		33,686	3,283	1,801	728	5,789	J		J15			
1909			55,472	311		30,898	2,296	1,264	639	3,060	J		J6			
1910			73,011	240		33,143	2,160	1,128	469	6,841	J		J4			
1911			81,134	227		31,317	1,695	1,279	472	10,721	J		J8			
1912			87,269	206		28,602	970	1,593	484	9,263	K					K
1913			97,788	189		23,894	956	2,375	525	12,499	K		K			
1914			99,775	223		21,920	1,336	3,104	503	14,309	K		K			
1915			86,592	208		19,042	876	2,823	437	18,192	K		K			
1916			90,952	197		17,714	769	8,738	L1,202	15,248	K		K	45		
1917			93,878	121		15,777	760	36,536	L3,088	11,392	K			100		
1918			97,532	143		13,366	878	45,451	L4,368	16,043	K			69		
1919			101,183	121		11,960	972	33,048	9,278	17,188	K		K	90		K
1920		K	103,377	111		10,774	945	39,005	8,738	35,714			K	340		K
1921		10,473	112,600	108		10,043	1,158	36,456	9,013	27,103			K	1,509		K
1922		12,712	138,468	97		9,383	1,087	31,766	8,973	35,376			K	2,449		K
1923		36,610	262,876	86		8,707	1,043	28,250	8,069	24,919			K	2,782		K
1924		46,028	228,933	445		8,081	935	28,836	7,407	21,124				2,815		98
1925		77,398	232,492	1,226		7,863	829	38,357	6,759	20,272	4			4,091		1,060
1926		58,332	224,673	2,768		7,760	808	41,498	6,274	23,201	94			7,727		1,666
1917		40,005	231,196	2,831		6,994	852	41,069	6,719	22,818	439			5,058		1,226
1928		32,096	231,811	2,774		6,462	1,052	38,596	7,359	21,847	594			4,015		943
1929		24,917	292,534	2,358		6,319	981	42,813	7,775	20,554	4,528			3,980		1,830
1930		19,702	227,329	1,656		5,736	994	41,638	7,389	23,272	3,911			3,349		10,189
1931		14,791	188,830	1,545		5,039	840	37,018	6,456	21,804	3,789			2,830		15,227
1932		12,051	178,128	1,136		4,673	806	34,848	6,287	21,807	6,910		K	2,457		12,455
1933		11,686	172,010	919		4,244	737	41,976	4,608	25,168	7,942	K	K	2,273		14,116
1934		11,182	174,305	1,139		4,479	838	46,482	4,860	32,869	10,603	K	K	3,603		16,864
1935		11,008	207,832	1,560		4,322	777	54,843	5,258	50,330	15,776	K	K	4,603		20,483
1936		10,469	214,773	1,650		4,475	822	58,317	5,633	80,491	11,928		K	5,868		27,223
1937		11,764	238,521	1,605		7,499	844	70,761	5,484	90,924	16,628		K	5,805		38,854
1938		18,180	249,749	1,412		24,075	995	60,064	5,821	95,208	18,745		K	4,946		35,759
1939		21,238	224,354	1,404		94,912	1,711	60,703	5,621	93,646	23,462	107	40	5,960	2	37,637
1940		25,775	223,881	1,626		147,647	4,978	66,139	5,188	103,584	19,753	4,400	44	6,728	276	39,129
1941		26,327	230,263	2,150		132,393	7,411	83,242	4,762	115,908	16,359	15,327	47	7,526	1,898	39,569
1942		26,628	248,326	2,199		106,391	6,743	97,63F	4,534	115,785	21,754	28,833	36	8,074	1,237	31,544
1943		27,600	284,188	2,320	4	82,260	5,283	106,178	7,883	123,592	20,768	18,807	36	7,916	635	38,896
1944	43	29,418	311,793	3,083	12	77,413	5,118	98,762	9,621	129,645	18,490	16,337	45	8,647	417	39,555
1945	181	28,613	326,482	5,036	30	75,094	4,868	96,415	10,325	131,051	17,267	19,062	45	8,420	305	37,351
1946	380	28,375	314,713	11,856	57	75,297	6,726	97,218	10,578	143,669	17,074	24,298	51	8,825	293	36,814
1947	396	29,948	333,132	15,702	259	66,459	6,095	105,132	9,397	160,128	16,215	34,925	55	8,742	229	40,926
1948	466	31,682	340,074	17,878	290	64,808	6,974	110,908	8,801	181,458	16,871	45,761	44	9,382	215	47,969
1949	462	29,986	332,942	23,587	441	64,501	9,696	101,868	8,803	190,826	16,517	37,966	49	9,118	330	47,645
1950	735	31,108	327,607	23,303	487	62,028	10,699	107,586	10,381	208,965	15,826	38,236	32	8,109	1,547	47,367
1951	1,020	29,798	354,561	27,823	596	60,243	11,100	114,522	11,622	232,281	13,927	37,039	24	8,958	2,588	52,719
1952	1,279	29,44C	359,450	30,381	591	60,089	12,037	114,807	11,918	243,929	13,251	36,310	21	9,606	2,660	58,681
1953P	1,705	29,608	365,021	33,275	540	58,976	13,039	114,198	11,565	254,624	12,316	35,383	22	11,748	5,929	70,513
Total	6,677	884,948	9,698,63C	238,489	3,307	1,685,624	236,899	2,443,050	287,351	3,291,850	361,741	392,791	645	198,563	18,531	864,308

A Ut. prod. est. at 3,650 bbls. in 1939; 3,126 bbls. in 1940; and 189,726 bbls. cum. through 1940.

B *Petroleum in U. S. and Possessions*, by Arnold and Kemnitzer, shows for Alas. following data: 1904-1919, est., 56,000 bbls.; 1920, 11,000 bbls; 1921, 10,000 bbls.; 1922-1928, est., 73,000 bbls.; total, 1904-1928, 150,000 bbls.

C "Unclassified" includes 1912, Alas. and Mich.; 1913, Alas., Mich., Mo. and N. Mex.; 1914-16, Alas., Mich. and Mo.; 1917-18, Alas. and Mich.; 1919, Alas., Mich., Mo. and N. Mex.; 1920. Alas., Ark., Mo., N. Mex. and Ut.; 1921-23, Alas., Mo. and N. Mex.; 1924-31, Alas. and Ut.; 1932, Alas., Mo. and Ut.; 1933, Alas., Mis., Mo. and Ut.; 1934, Mis., Mo. and Ut.; 1935, Mis., Mo., Ten. and Ut.; 1936-1938; Mo., Ten. and Ut.

D Pa. and N. Y. separated in years 1864-1881, by aid of *Petroleum in U. S. and Possessions*, by Arnold and Kemnitzer.

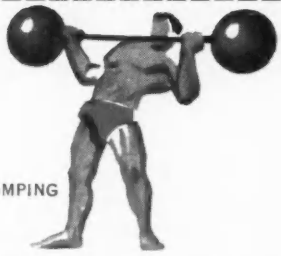
E *Petroleum in U. S. and Possessions* gives following additional estimates not shown by official *Mineral Resources;* O., 1860-1875, 200,000 bbls.; W. Va., 1860-1875, 2,800,000 bbls.; Ky., 1860-1882, 161,000 bbls.

F N. Y. incl. with Pa.

WHAT IS YOUR WELL CONDITION?

CORROSIVE

ABRASIVE


HEAVY PUMPING

HEAVY IMPACT

EASY PUMPING

GASSY

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FOR THE FINEST IN PETROLEUM PUMPING EQUIPMENT

AXELSON MANUFACTURING COMPANY DIVISION

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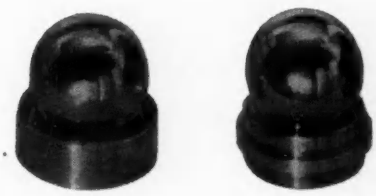
BOX CARS • HOPPER CARS • GONDOLA CARS • REFRIGERATOR CARS • STANDARD PARTS • DAIRY CANS & EQUIPMENT • SELF-CLOSING WASTE RECEPTACLES • PERMANENT STAINLESS STEEL COOKWARE • AUTOMOBILE ACCESSORIES • FARM HOLDING TANKS • STORAGE HOPPERS • ALLOY STEEL CONTAINERS • OIL STORAGE TANKS • RENDERING & SOFTENING TANKS • RESIDENTIAL FUEL OIL TANKS • AGITATORS • SMOKE STACKS • DUST COLLECTORS • COAL & ASH HOPPERS • LOCK NUTS & BUSHINGS • COUPLINGS & CONNECTORS • FITTINGS & ELECTRICAL ACCESSORIES • ORDNANCE MATERIEL • UNISHELTER RELOCATABLE HOMES • EXPORT ONLY: LOCOMOTIVES & TRACKWORK • MINE & ORE CARS • UNISTRUT METAL FRAMING • CANE CARS • INSPECTION CARS • WEED BURNERS • BRICK & TILE MACHINERY • CANE LOADERS

Check the information below and realize that Axelson provides the right combination of **matched** seat-and-ball for every pumping condition.

As with all Axelson products, this vital pump part is the finest obtainable. Axelson seat-and-ball quality is your best insurance against costly production failures. Each micro-finished ball has mechanically perfect mating with each of the two precision ground surfaces of the seat. Hence, seat-and-ball becomes a matched pair, vacuum tested as a pair and packaged as a pair.



AXLOY Very hard stainless steel, hardened and tempered in controlled electric furnaces. Recommended for almost every well condition except where well depth, fluid gravity, strokes per minute, etc., create heavy seat-and-ball impact, or where there are extreme "outlaw" conditions of corrosion and abrasion.

XL Combines the very hard stainless AXLOY ball with a moderately hard stainless steel seat. Recommended for heavy pumping wells where a harder seat may chip due to ball impact. Priced lower than AXLOY.

AXREX Hard cobalt-chromium-tungsten alloy, centrifugally cast. It gives a superior service in corrosive pumping wells.

TUNGSTEN CARBIDE Super hard cemented carbide alloy. Made by powder metallurgy under extreme pressure at extreme temperatures. Recommended for any conditions of corrosion and abrasion.

ACME A low cost combination offering excellent wear resistance where corrosion and abrasion are not serious. Recommended for easy pumping conditions.

PLANTS: Los Angeles 58, California; St. Louis 16, Missouri. **OFFICES:** New York 7, New York; Tulsa 1, Oklahoma; Buenos Aires, Argentina. **DISTRIBUTORS:** Jones & Laughlin Steel Corp., Supply Division; Great Northern Tool & Supply Co.; Industrial Agencies Ltd., San Fernando, Trinidad, B.W.I.; Industrias Waldrip & Campbell, Barcelona, Caracas and Maracaibo, Venezuela; Sociedad Commercial de Materias Primas Limitado, Rio de Janeiro, Brazil; Adrian Bolland & Co., Avda. Pte R. Saenz Pena 832, Buenos Aires, Argentina; Wells Fargo & Co., Express, S.A., Apartado Postal 361, Mexico, D.F.; Dominion Oilfields Supply Co., Ltd., Calgary, Canada.

United States Crude Oil Production, By States, By Years (Part 2)

Data in thousands of barrels; from *Mineral Resources and Minerals Yearbook*, except where otherwise indicated in footnotes.

New York, Ohio, Pennsylvania, West Virginia, and U. S. Total, 1859-1885

Year	New York	Penn-syl-vania	U.S.	Value at Wells $1,000	[O] Value per Bbl. $	Year	New York	Penn-syl-vania	Total U.S.	Value at Wells $1,000	[O] Value per Bbl. $	Year	New York	Ohio	Penn-syl-vania	W. Va.	Total U.S.	Value at Wells $1,000	[O] Value per Bbl. $
1856	.....	.....	.....	.....	.....	1866	[D]144	[D]3,454	3,598	13,455	3.75	1876	[D]359	32	[D]8,610	120	9,133	22,983	2.52
1857	.....	.....	.....	.....	.....	1867	[D]134	[D]3,213	3,347	8,067	2.40	1877	[D]525	30	[D]12,610	172	13,350	31,789	2.38
1858	.....	.....	.....	.....	.....	1868	[D]146	[D]3,500	3,646	13,217	3.62	1878	[D]607	38	[D]14,557	180	15,397	18,045	1.17
1859	.....	2	2	32	20.00	1869	[D]169	[D]4,046	4,215	23,730	5.60	1879	[D]787	29	[D]18,898	180	19,914	17,211	.86
1860	.....	500	500	4,800	9.60	1870	[D]211	[D]5,050	5,261	20,504	3.90	1880	[D]1,041	39	[D]24,987	179	26,286	24,601	.94
1861	.....	2,114	2,114	1,036	.52	1871	[D]208	[D]4,997	5,205	22,591	4.40	1881	[D]1,095	34	[D]26,281	151	27,661	25,448	.92
1862	.....	3,057	3,057	3,210	1.05	1872	[D]252	[D]6,041	6,293	21,440	3.75	1882	6,685	40	23,368	128	30,350	23,631	.78
1863	.....	2,611	2,611	8,226	3.15	1873	[D]396	[D]9,498	9,894	18,100	1.80	1883	4,004	47	19,125	126	23,450	25,790	1.10
1864	[D F H]	[D F]2,116	2,116	20,897	8.15	1874	[D]437	[D]10,490	10,927	12,648	1.15	1884	3,231	90	20,541	90	24,218	20,596	.85
1865	[D]100	[D]2,398	2,498	16,460	6.59	1875	[D]352	[D]8,436	8,788	7,368	.97	1885	2,658	662	18,118	91	21,859	19,198	.88

New York, North Dakota, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, West Virginia, Wyoming, and U. S. Total, 1886 to Now

Year	New York	N. Da-kota	Ohio	Okla-homa	Penn-sylvania	Tenn-essee	Texas	[A] Utah	Vir-ginia	West Virginia	Wy-oming	[B] Al-aska	[C] Un-class-ified	Total United States	Value at Wells $1,000	[O] Value per Bbl. $
1886	2,151	.....	1,783	.....	23,647	[G]	.....	.....	.....	102	.....	.....	.....	28,065	19,996	.71
1887	2,075	.....	5,023	.....	20,281	[G]	.....	.....	.....	145	.....	.....	.....	28,283	18,877	.67
1888	1,789	.....	10,011	.....	14,700	[G]	.....	.....	.....	119	.....	.....	.....	27,612	17,948	.65
1889	1,897	.....	12,472	.....	19,591	[G]	[H]	.....	.....	544	.....	.....	.....	35,164	26,963	.77
1890	1,658	.....	16,125	.....	26,800	[G]	.....	.....	.....	493	.....	.....	.....	45,824	35,365	.77
1891	1,585	.....	17,740	[H]	31,424	[G]	[H]	.....	.....	2,406	.....	.....	.....	54,293	30,527	.56
1892	1,273	.....	16,363	[H]	27,149	[G]	[H]	.....	.....	3,810	.....	.....	.....	50,515	25,907	.51
1893	1,032	.....	16,249	[H]	19,283	[G]	[H]	.....	.....	8,446	.....	.....	.....	48,431	28,950	.60
1894	942	.....	16,792	[H]	18,078	[G]	[H]	.....	.....	8,577	2	.....	.....	49,344	35,522	.72
1895	913	.....	19,545	[H]	18,231	[G]	[H]	.....	.....	8,120	4	.....	.....	52,892	57,632	1.09
1896	1,205	.....	23,941	[H]	19,379	[G]	1	.....	.....	10,020	3	.....	.....	60,960	58,519	.96
1897	1,279	.....	21,561	1	17,983	[G]	66	.....	.....	13,090	4	.....	.....	60,476	40,874	.68
1898	1,205	.....	18,739	.....	14,743	[G]	546	.....	.....	13,615	6	.....	.....	55,364	44,193	.80
1899	1,321	.....	21,142	.....	13,054	[G]	669	.....	.....	13,911	6	.....	.....	57,071	64,604	1.13
1900	1,301	.....	22,363	6	13,258	[G]	836	.....	.....	16,196	6	.....	.....	63,621	75,989	1.19
1901	1,207	.....	21,648	10	12,625	[G]	4,394	.....	.....	14,177	5	.....	.....	69,389	66,417	.96
1902	1,120	.....	21,014	37	12,064	[G]	18,084	.....	.....	13,513	6	.....	.....	88,767	71,179	.80
1903	1,163	.....	20,480	139	11,355	[G]	17,956	.....	.....	12,900	9	.....	.....	100,461	94,694	.94
1904	1,113	.....	18,877	1,367	11,126	[G]	22,241	.....	.....	12,645	12	[N]	.....	117,081	101,175	.86
1905	1,118	.....	16,347	[I]8,264	10,437	[G]	28,136	.....	.....	11,578	8	.....	.....	134,717	84,157	.62
1906	1,243	.....	14,788	[I]18,091	10,257	[G]	12,568	.....	.....	10,121	7	.....	.....	126,494	92,445	.73
1907	1,212	.....	12,207	43,524	10,000	[G]	12,323	[M]	.....	9,095	[M]9	[N]	.....	166,095	120,107	.72
1908	1,160	.....	10,859	45,799	9,424	.....	11,207	[M]	.....	9,523	[M]18	.....	.....	178,527	129,079	.72
1909	1,135	.....	10,633	47,859	9,299	.....	9,534	[M]	.....	10,745	[M]20	.....	.....	183,171	128,329	.70
1910	1,054	.....	9,916	52,029	8,795	.....	8,899	[M]	.....	11,753	[M]115	.....	.....	209,557	127,900	.61
1911	953	.....	8,817	56,069	8,248	.....	9,526	[M]	.....	9,796	[M]187	[N]	.....	220,449	134,045	.61
1912	874	.....	8,969	51,427	7,838	.....	11,735	[M]	.....	12,129	[M]1,572	[K]	4	222,935	164,213	.74
1913	948	.....	8,781	63,579	7,917	.....	15,010	[N]	.....	11,567	2,407	[K]	11	248,446	237,121	.95
1914	939	.....	8,536	73,632	8,170	.....	20,068	[N]	.....	9,680	3,560	[K]	8	265,763	214,125	.81
1915	888	.....	7,825	97,915	7,838	.....	24,943	[N]	.....	9,265	4,246	[K]	14	281,104	179,463	.64
1916	874	.....	7,744	107,072	7,593	[L]1	27,645	[N]	.....	8,731	6,234	[K]	8	300,767	330,900	1.10
1917	880	.....	7,751	107,508	7,733	[L]12	32,413	[N]	.....	8,379	8,978	[K]	10	335,316	522,635	1.56
1918	809	.....	7,285	103,347	7,408	[L]8	38,750	[N]	.....	7,867	12,596	[K]	8	355,928	703,944	1.98
1919	851	.....	7,736	86,911	8,137	15	79,366	[N]	.....	8,327	13,172	[K]	12	378,367	760,266	2.01
1920	906	.....	7,400	106,206	7,438	14	96,868	[K]	.....	8,249	16,831	[K]	13	442,929	1,360,745	3.07
1921	988	.....	7,335	114,634	7,418	12	106,166	.....	.....	7,822	19,333	[K]	12	472,183	814,745	1.73
1922	1,000	.....	6,781	149,571	7,425	10	118,684	.....	.....	7,021	26,715	[K]	13	557,531	895,111	1.61
1923	1,250	.....	7,085	160,929	7,609	8	131,023	.....	.....	6,358	44,785	[K]	18	732,407	978,430	1.34
1924	1,440	.....	6,811	173,538	7,486	10	134,522	[K]	.....	5,920	39,498	[K]	13	713,940	1,022,683	1.43
1925	1,695	.....	7,212	176,768	8,097	24	144,648	[K]	.....	5,763	29,173	[K]	12	763,743	1,284,960	1.68
1926	1,956	.....	7,272	179,195	8,961	43	166,916	[K]	.....	5,946	25,776	[K]	8	770,874	1,447,760	1.88
1927	2,242	.....	7,593	277,775	9,526	60	217,389	[K]	.....	6,023	21,307	[K]	7	901,129	1,172,830	1.30
1928	2,603	.....	7,015	249,857	9,956	46	257,320	[K]	.....	5,661	21,461	[K]	6	901,474	1,054,880	1.17
1929	3,377	.....	6,743	255,004	11,820	19	296,876	[K]	.....	5,574	19,314	[K]	7	1,007,323	1,280,417	1.27
1930	3,647	.....	6,486	216,486	12,803	21	290,457	[K]	.....	5,071	17,868	[K]	7	898,011	1,070,200	1.19
1931	3,363	.....	5,327	180,574	11,892	6	332,437	[K]	.....	4,472	14,834	[K]	7	851,081	550,630	.65
1932	3,508	.....	4,644	153,244	12,412	5	312,478	[K]	.....	3,876	13,418	[K]	16	785,159	680,460	.87
1933	3,181	.....	4,235	182,251	12,624	5	402,609	[K]	.....	3,815	11,227	[K]	30	905,656	608,000	.67
1934	3,804	.....	4,234	180,107	14,478	10	381,516	[K]	.....	4,095	12,556	.....	41	908,065	904,825	1.00
1935	4,236	.....	4,082	185,288	15,810	[K]	392,666	[K]	.....	3,902	13,755	.....	65	996,596	961,440	.96
1936	4,663	.....	3,847	206,555	17,070	[K]	427,411	[K]	.....	3,847	14,582	.....	63	1,099,687	1,199,820	1.09
1937	5,478	.....	3,559	228,839	19,189	[K]	510,318	[K]	.....	3,845	19,166	.....	77	1,279,160	1,513,340	1.18
1938	5,045	.....	3,298	174,994	17,426	[K]	475,850	[K]	.....	3,684	19,022	.....	82	1,214,355	1,373,060	1.13
1939	5,098	.....	3,156	159,913	17,382	50	483,528	4	.....	3,580	21,454	.....	.....	1,264,962	1,294,470	1.02
1940	4,999	.....	3,159	156,164	17,353	24	493,209	3	.....	3,444	25,711	.....	.....	1,353,214	1,385,440	1.02
1941	5,185	.....	3,510	154,702	16,750	12	505,572	4	.....	3,433	29,878	.....	.....	1,402,228	1,602,000	1.14
1942	5,421	.....	3,543	140,690	17,779	9	483,097	.....	.....	3,574	32,812	.....	.....	1,386,645	1,643,470	1.19
1943	5,059	.....	3,322	123,152	15,757	10	594,343	.....	2	3,349	34,253	.....	.....	1,505,613	1,809,020	1.20
1944	4,697	.....	2,937	124,616	14,118	8	746,699	.....	4	3,070	33,356	.....	.....	1,677,904	2,032,960	1.21
1945	4,648	.....	2,828	139,299	12,515	8	754,710	.....	4	2,879	36,219	.....	.....	1,713,655	2,094,250	1.22
1946	4,863	.....	2,908	134,794	12,996	10	760,215	.....	23	2,929	38,977	.....	.....	1,733,939	2,442,550	1.41
1947	4,762	.....	3,108	141,019	12,690	8	820,210	.....	61	2,617	44,772	.....	.....	1,856,987	3,577,890	1.93
1948	4,621	.....	3,600	154,455	12,667	6	903,498	.....	33	2,692	55,032	.....	.....	2,020,185	5,245,080	2.60
1949	4,425	.....	3,483	151,660	11,374	18	744,834	637	43	2,839	47,890	.....	.....	1,841,940	4,674,770	2.54
1950	4,143	.....	3,383	164,599	11,859	12	829,874	1,228	21	2,808	61,631	.....	.....	1,973,574	4,963,380	2.51
1951	4,254	25	3,140	186,869	11,345	14	1,010,270	1,305	12	2,757	68,929	.....	.....	2,247,711	5,690,410	2.53
1952	4,242	1,549	3,350	190,435	11,233	15	1,022,139	1,737	10	2,602	68,074	.....	.....	2,289,836	5,785,230	2.53
1953[P]	3,907	5,108	3,555	202,821	10,554	12	1,023,754	1,804	15	3,021	84,468	.....	.....	2,357,481	6,294,475	2.67
Total	189,414	6,682	631,044	6,841,589	1,158,295	545	16,779,022	6,722	228	449,340	1,137,269	.....	572	47,814,116	75,998,864	1.59

[G] Tenn. incl. with Ky., 1876-1907, incl.

[H] Less than 500 bbls.

[I] Figures for Okla. and Kan. for years 1905-1906 shown together by *Mineral Resources;* here divided by aid of *Petroleum in U. S. and Possessions*, by Arnold and Kemnitzer.

[J] Mich. shown with Mo. in 1900-1911.

[K] Included under "Unclassified."

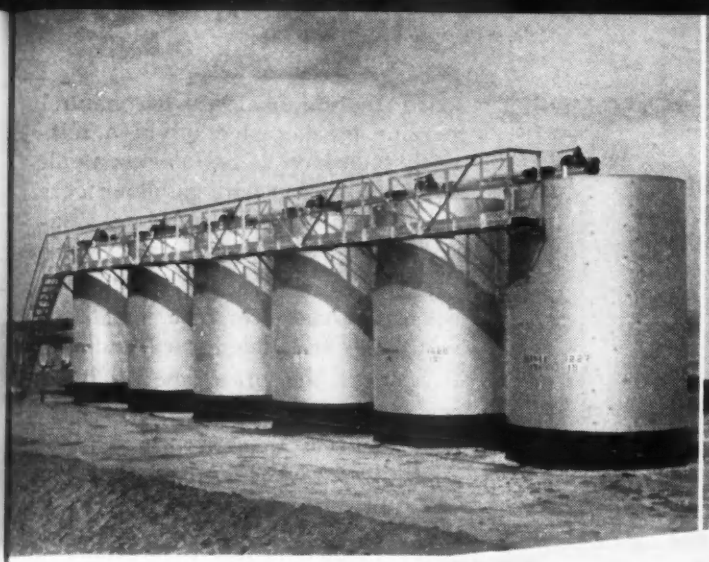
[L] Ky. and Tenn. in 1916-18 obtained with aid of *Mineral Resources and Petroleum in U. S. and Possessions.*

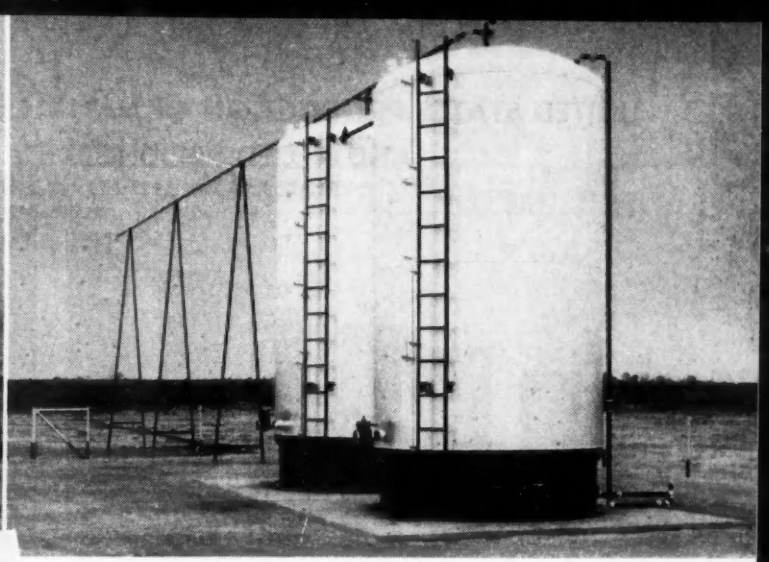
[M] Small prod. of Ut. (mostly used as fuel) shown with Wyo.

[N] Little prod. but no record available.

[O] Average price per bbl. for 1859-1875 from *Petroleum in U. S. and Possessions;* remainder from *Mineral Resources* and *Minerals Yearbook* except 1950 and 1951 estimated.

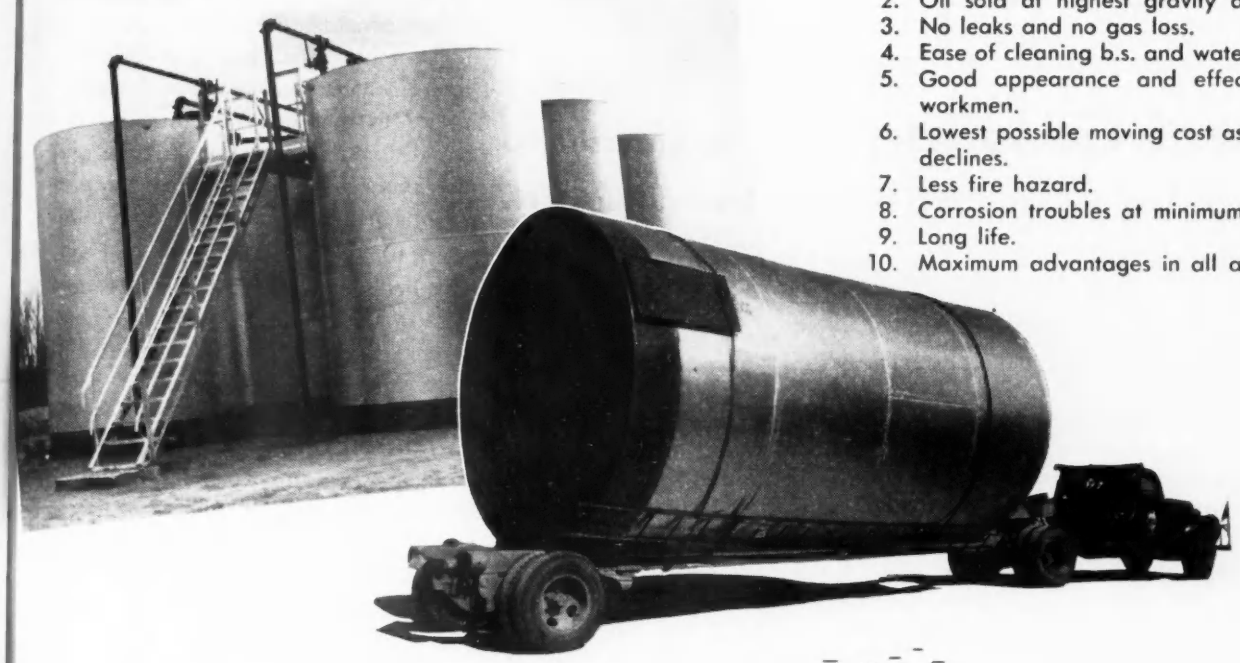
[P] Bureau of Mines for first 10 months; Nov. and Dec. est. by World Oil, from weekly reports of API and other sources.





ADVANTAGES OF NATIONAL WELDED STORAGE TANKS

1. 100% vapor recovery (pressure or vacuum).
2. Oil sold at highest gravity at all times.
3. No leaks and no gas loss.
4. Ease of cleaning b.s. and water.
5. Good appearance and effect on lease workmen.
6. Lowest possible moving cost as production declines.
7. Less fire hazard.
8. Corrosion troubles at minimum.
9. Long life.
10. Maximum advantages in all above cases.



NATIONAL *Welded* STORAGE TANKS

Since 1927, thousands of National Welded Storage Tanks have been placed in service in the oil fields throughout the world. Many hundreds of tanks are still in service after 20 years, during which time innumerable moves have been made without leaks or failures.

For the storage of salt water cut crude, National devised the now famous coned bottom tanks with a built-in water and b.s. trap in the bottom for periodic bleeding off of those corrosive elements.

National was one of the first manufacturers to join in the adoption and production of API-P & M lease storage welded tanks.

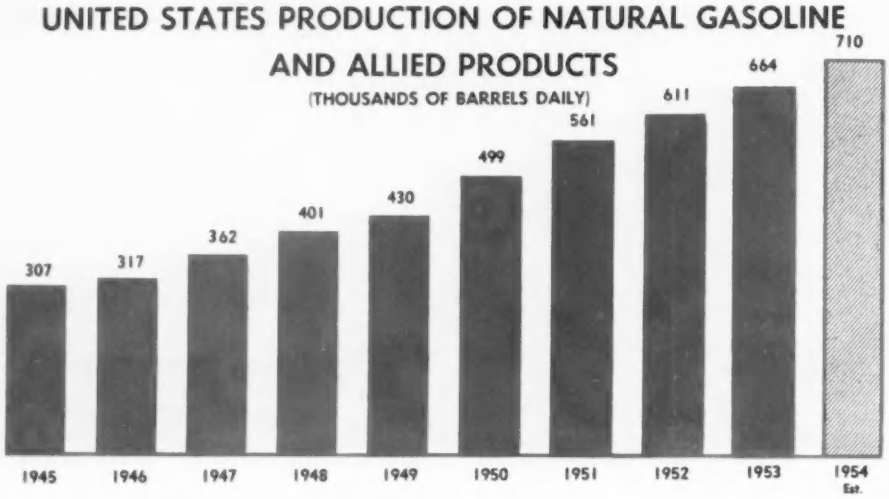
National Standard Welded Storage Tanks are available in capacities from 65 bbls. to 400 bbls.

It's a National

NATIONAL TANK COMPANY

TULSA, OKLAHOMA

10-9-52



Natural Gasoline . . . production to remain high, but upward trend is due to level off in 1954.

PRODUCTION OF natural gasoline and allied products will continue along the upward trend in 1954, but at a rate less pronounced than in recent years.

For these liquid petroleum products extracted from natural gas, market conditions turned unfavorable last year, and they remained that way early this year.

Production exceeded market demand in 1953, and stocks of natural gasoline became burdensome. The inventories at the end of 1953 exceeded 12 million barrels, or more than 50 percent above the 7.8 million barrels at the beginning of the year. The sharp increase in stocks was in line with the accompanying excessive accumulation of total stocks of motor fuel, of which natural gasoline is a part.

Prices of natural gasoline have reacted very definitely to the overproduction and excessive stockpiling of motor fuel, and depressed prices are a cloud over the natural gasoline industry as 1954 begins. The average price of natural gasoline at the plant in the Mid-Continent (Group 3) was only 5.5 cents a gallon in late January, indicating that the average for 1954 may be around that level, if not lower. This would compare with an average of about 5.8 cents for 1953 and 6.2 cents for 1952 and 1951 and be back close to the levels of 5.6 cents a gallon in 1950 and 5.7 cents in 1949, when surpluses hurt the markets.

U. S. Production of Natural Gasoline and Allied Products

(Source: Bureau of Mines except Nov.-Dec., 1953 estimated. New series beginning 1941 includes cycle condensate.)

THOUSANDS OF BARRELS

Year	Total	Daily	Year	Total	Daily
Natural Gasoline			1936	42,770	117
1918	6,727	18	1937	49,177	135
1919	8,370	23	1938	51,347	141
1920	9,161	25	1939	51,650	142
			1940	55,700	152
			Natural Gasoline and Allied Products		
1921	10,713	29	1941	80,855	222
1922	12,044	33	1942	83,222	228
1923	19,434	53	1943	87,716	240
1924	22,235	61	1944	100,046	273
1925	26,845	74	1945	112,004	307
1926	32,455	89	1946	115,739	317
1927	39,075	107	1947	132,173	362
1928	43,191	118	1948	146,721	401
1929	53,183	146	1949	157,086	430
1930	52,631	144	1950	181,961	499
1931	43,617	119	1951	204,754	561
1932	36,281	99	1952	223,515	611
1933	33,810	93	1953	242,363	664
1934	36,556	100	1954		
1935	39,333	108	Est	259,000	710

Price Trend. In 1953, the natural gasoline price started off at a relatively high level of 6.875 cents a gallon, Group 3, but with gasoline stocks rising, dropped sharply in late January and February to 5.5 cents.

The price stayed there until August, when seasonally high demand for motor fuel stimulated sales, and in a few weeks the price rose to 6.375 cents a gallon, where it held until late October. It then dropped abruptly to 5.5 cents a gallon, where it remained in late January, 1954.

LPG Increase. The proportion of natural gasoline going into liquefied petroleum gas products has continued to increase, and the ratio used for blending with other hydrocarbons to make motor fuel has been decreasing. However, use in motor fuel continues to increase in volume as demand for that product rises, and this remains the principal use, representing over 60 percent of the total.

In 1953 sales of LPG for fuel and chemicals represented about 36.6 percent of the demand for natural gasoline, compared with 35.5 percent in 1952 and only 30 percent in 1948. LPG (butane, propane, etc.) is used in cooking, home heating, chemicals, and as a motor fuel for tractors, trucks, busses and drilling rigs.

Sales Breakdown. Of the natural gasoline sold in 1953 about 46.7 percent went to refineries and 15 percent to jobbers for use as motor fuel.

Motor fuel continues to be derived from natural gasoline and crude oil in unchanged proportions. Of all motor fuel produced in both 1952 and 1953 about 11.7 percent came from natural gasoline.

U. S. production of natural gasoline and benzol will average 710,000 barrels daily in 1954, the Bureau of Mines forecasts. That would be 6.7 percent above 1953. The output of 665,000 barrels daily in 1953 was 8.7 percent above the 612,000 of 1952. However, nearly 4½ million barrels or an average of over 12,000 barrels daily went into storage, and actual consumption was up only 6.4 percent, to 652,000 barrels daily from 613,000 in 1952.

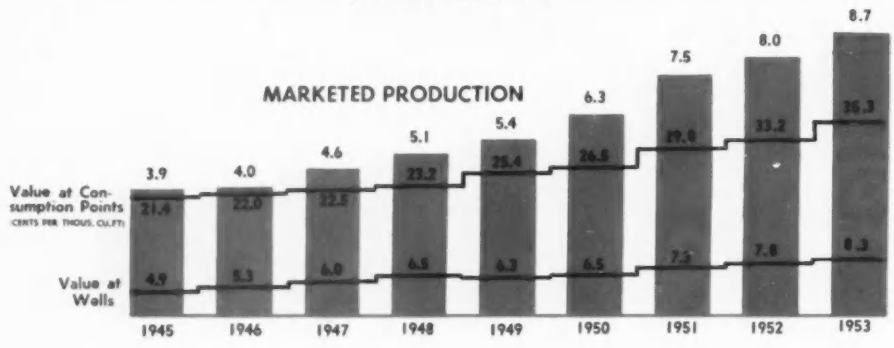
Production of Natural Gasoline and Allied Products, by States, by Years

(Natural Gasoline, Cycle Products, and Liquefied Petroleum Gases. Source: Bureau of Mines. Data in Thousands of Barrels.)

YEAR	Arkansas	California	Colorado	Illinois	Kansas	Kentucky	Louisiana	Michigan	Mississippi	Montana	New Mexico
Natural Gasoline:											
1911	.....	1	.....	4	.....	.....	.....	....	....	....	....
1912	.....	25	.....	7	.....	.....	.....	....	....	....	....
1913	.....	82	.....	14	.....	.....	.....	....	....	....	....
1914	.....	180	.....	28	.....	.....	.....	....	....	....	....
1915	.....	306	.....	25	1	.....	5	....	....	....	....
1916	.....	409	.....	54	5	17	50	....	....	....	....
1917	.....	686	.....	117	28	91	119	....	....	....	....
1918	.....	768	.....	109	57	79	167	....	....	....	....
1919	.....	962	.....	144	78	122	240	....	....	....	....
1920	.....	1,148	.....	144	103	107	253	....	....	....	....
1921	.....	1,386	.....	179	85	101	365	....	....	....	....
1922	102	1,598	.....	185	68	124	700	....	....	....	....
1923	385	4,127	.....	175	209	181	969	....	....	....	....
1924	418	5,538	.....	216	278	173	1,145	....	....	....	....
1925	469	7,219	1	235	466	183	1,035	....	....	....	....
1926	723	9,271	7	238	604	183	1,037	....	....	....	35
1927	893	11,858	22	211	859	178	1,068	....	....	....	44
1928	778	13,907	45	186	875	173	1,310	....	....	....	36
1929	796	20,008	39	169	863	143	1,547	....	....	....	25
1930	730	19,754	31	164	836	158	1,755	....	....	....	87
1931	626	16,198	16	120	778	130	1,382	....	....	....	423
1932	444	13,140	11	109	590	116	1,100	....	....	....	417
1933	362	11,817	10	87	592	108	880	4	....	31	456
1934	310	12,054	15	91	664	99	966	14	....	30	518
1935	311	12,729	10	63	774	142	1,184	44	....	41	466
1936	285	14,128	11	56	899	143	1,731	48	....	49	689
1937	269	14,855	10	61	1,358	175	2,534	57	....	54	911
1938	611	15,736	9	58	1,333	167	2,277	86	....	42	1,181
1939	587	14,458	9	95	1,481	185	2,240	71	....	51	1,303
1940	764	13,988	9	511	1,541	228	2,708	93	....	62	1,326
1941	669	13,741	9	1,306	1,736	245	4,786	135	....	61	1,645
Cumulative	10,532	252,077	264	5,161	17,161	3,743	33,553	552	....	421	9,562
Natural Gasoline and Allied Products:											
1941	819	15,709	9	2,218	2,040	842	5,374	135	....	94	1,929
1942	1,016	15,079	8	3,317	1,948	873	7,049	60	....	108	2,123
1943	1,353	16,508	[1]	4,417	2,029	1,031	7,287	29	....	111	1,929
1944	1,798	18,364	[1]	4,628	1,663	1,161	11,730	202	....	114	1,932
1945	2,046	21,232	[1]	4,190	1,729	1,116	13,077	324	....	112	2,329
1946	2,012	21,679	20	3,847	1,966	1,282	13,495	294	....	109	2,468
1947	2,240	25,336	24	3,869	2,362	1,422	14,973	102	475	137	2,692
1948	2,259	26,549	33	3,539	2,561	1,566	16,901	62	1,123	201	3,103
1949	2,280	27,154	342	3,218	2,647	1,620	19,254	86	1,271	230	4,025
1950	2,333	28,328	[1]	3,107	3,687	1,779	20,768	79	1,312	251	5,019
1951	2,348	29,533	[1]	[2]2,971	4,226	2,166	22,482	[2]	1,202	277	5,588
1952	2,587	29,992	[1]	[2]2,767	4,644	4,567	22,897	[2]	1,201	204	6,636
1953	2,734	31,158	[1]	[3]3,827	[4]4,945	5,021	22,485	[2]	1,192	[1]	7,406
1952 Daily Average	7.1	81.9	.....	7.6	12.7	12.5	62.5	.....	3.3	0.5	18.1
1953 Daily Average	7.5	85.4	.....	10.5	13.5	13.7	61.6	.....	3.3	.....	20.3

YEAR	New York	Ohio	Oklahoma	Pennsylvania	Texas	Utah	West Virginia	Wyoming	Others	Total	VALUE AT PLANT $ Thous.	VALUE AT PLANT ¢ Gal.
Natural Gasoline:												
1911	....	40	9	35	.....	....	87	.....	1	177	$ 532	7.2
1912	....	41	37	49	.....	....	127	.....	2	288	1,157	9.6
1913	....	49	154	88	.....	....	183	.....	3	573	2,458	10.2
1914	....	58	410	110	.....	....	221	.....	7	1,014	3,106	7.3
1915	....	52	754	140	[3]	....	258	.....	12	1,556	5,151	7.9
1916	6	63	1,151	231	31	....	447	.....	....	2,464	14,331	13.8
1917	4	130	2,741	329	165	....	778	.....	....	5,188	40,189	18.4
1918	5	161	3,898	376	174	....	895	38	....	6,727	50,364	17.8
1919	11	209	4,524	483	222	....	1,242	133	....	8,370	64,197	18.3
1920	10	238	4,259	504	784	....	1,403	207	....	9,160	71,788	18.7
1921	9	217	4,413	473	1,837	....	1,301	347	....	10,713	61,815	13.7
1922	12	205	4,510	441	2,272	....	1,352	475	....	12,044	72,711	14.4
1923	10	239	6,435	455	4,233	....	1,509	507	....	19,434	77,268	9.5
1924	11	225	7,168	458	4,442	....	1,466	697	....	22,235	82,233	8.8
1925	10	207	9,306	449	5,098	....	1,385	780	1	26,844	120,383	10.7
1926	13	258	11,327	484	5,788	....	1,519	967	1	32,455	136,412	10.0
1927	11	289	13,050	399	7,636	....	1,528	1,029	....	39,075	118,688	7.2
1928	9	314	14,755	395	7,727	....	1,660	1,020	1	43,191	138,944	7.7
1929	6	266	16,096	438	9,987	....	1,738	1,061	1	53,183	158,410	7.1
1930	5	213	14,076	398	11,698	....	1,508	1,217	1	52,631	128,160	5.8
1931	3	124	10,831	341	10,159	....	1,258	1,227	1	43,617	63,732	3.5
1932	3	123	9,014	278	8,836	....	1,042	1,057	1	36,281	49,244	3.2
1933	2	111	8,583	278	8,727	....	949	813	....	33,810	54,368	3.8
1934	2	140	8,462	257	11,109	....	997	828	....	36,556	60,523	3.9
1935	1	148	9,045	301	12,304	....	1,010	768	....	39,333	70,940	4.3
1936	....	166	9,967	340	12,394	....	1,057	807	....	42,770	84,572	4.7
1937	1	183	11,721	332	14,650	....	1,199	807	....	49,177	97,125	4.7
1938	1	176	11,155	254	16,331	....	1,200	730	....	51,347	87,266	4.0
1939	1	177	10,384	280	18,334	....	1,245	749	....	51,650	90,050	4.2
1940	....	192	9,509	366	22,191	....	1,400	812	....	55,700	68,261	2.9
1941	....	196	8,625	368	28,100	....	1,568	827	....	64,017	105,815	3.9
Cumulative	146	5,210	226,369	10,130	225,232	....	33,532	17,903	32	851,580	$2,180,193	6.1
Natural Gasln. and Allied Products:												
1941	....	196	10,795	381	37,116	....	2,334	864	....	80,855	119,120	3.5
1942	....	166	10,598	364	37,330	....	2,425	858	....	83,322	121,565	3.5
1943	....	155	10,055	417	39,191	....	2,332	[1]872	....	87,716	146,910	4.0
1944	....	173	10,042	417	44,534	....	2,117	[1]1,171	....	100,046	183,500	4.3
1945	....	154	9,909	338	52,103	....	2,086	[1]1,258	....	112,004	187,564	4.0
1946	....	149	9,881	262	54,357	14	2,868	1,036	....	115,739	180,281	3.7
1947	....	168	10,631	310	62,844	14	3,364	1,210	....	132,173	294,994	5.3
1948	....	150	11,178	291	72,116	14	3,637	1,438	....	146,721	458,977	7.4
1949	....	123	12,486	244	77,031	10	3,760	1,305	....	157,086	376,064	5.7
1950	....	103	14,733	246	93,650	[1]	4,623	[1]1,943	....	181,961	427,972	5.6
1951	....	107	17,542	210	108,531	[1]	4,951	[2]2,580	....	204,754	533,179	6.2
[5]1952	....	39	19,157	243	118,354	[1]	5,272	[2]2,914	[3]2,041	223,515	582,033	6.2
[5]1953	....	13	20,189	137	133,102	[1]	7,150	[2]3,004	....	242,363	590,396	5.8
1952 Daily Average	....	0.1	52.3	0.7	323.4	....	14.4	8.0	5.6	610.7	.....	....
1953 Daily Average	....	0.0	55.3	0.4	364.7	....	19.6	8.2	....	66.40	.....	....

[1] Wyo. in 1943-45 incl. Colo.; in 1950, Colo.-Ut.; in 1951-52, Colo.-Neb.-Ut.; in 1953, Colo.-Mont.-Ut. [2] Ill. in 1951-54 incl. Mich. [3] U.S. total final; data by states preliminary and short; shortages shown in "Others" column. [4] Kans. incl. Neb. [5] Nov.-Dec. est. by WORLD OIL.



Natural Gas Production and Use . . . Industry continues amazing growth. Further increases in output and consumption forecast for '54.

THE U. S. NATURAL GAS industry continued its amazing growth during 1953. Another big increase is looked for in 1954, the rate of increase in number of gas consuming customers still showing no signs of slowing down.

Annual marketed gas production reached 8.7 trillion cubic feet in 1953, double the volume produced in 1946 and three times greater than in 1941. This was 700 billion cubic feet more than the 8.0 trillion marketed in 1952. Biggest increase came from Texas, which produces half of the gas in the nation. Texas' marketed production in 1953 was 4.6 trillion cubic feet in contrast with 4.1 trillion cubic feet during 1952.

In line with the increase in production, the value of natural gas at wells showed further advancement, reaching an average of 8.3 cents per thousand cubic feet, in contrast with 7.8 cents in 1952 and 5.3 cents in 1946.

Gross production of natural gas is considerably higher, including amounts used in repressuring oil fields and volumes vented or wasted. Data are not yet available on gross production for 1953, but in 1952 the U. S. had a gross production of 10.2 trillion cubic feet. This included 1.4 trillion cubic feet used in repressuring operations, and 858 billion cubic feet vented or wasted.

Natural gas customers have increased more than 150 percent since 1940, while the volume of gas sold by utilities and transmission companies has increased 235 percent during the same period. The number of natural gas customers at the end of 1953 is estimated at 20,611,000, up 6.5 percent from the 19,357,000 at the end of the previous year.

Data on natural gas production, types of consumption, and other data since 1936, and marketed production by states by years since 1906 are presented in tables on following pages.

(SEE TABLES, PAGES 156-158-160)

Natural Gas Customers, Sales, and Revenues

(Source: American Gas Association)

ITEM	Actual 1952	Estimated 1953	Percent Change
Customers End of Year	**19,357,000**	**20,611,000**	**+ 6.5**
Residential	17,802,000	18,944,000	+ 6.4
Commercial	1,463,000	1,570,000	+ 7.3
Industrial	70,000	75,000	+ 7.1
Other	22,000	22,000	.....
Customers, Avg	**18,357,500**	**19,968,000**	**+ 8.8**
Residential	16,891,900	18,368,000	+ 8.7
Commercial	1,377,400	1,506,000	+ 9.3
Industrial	67,000	73,000	+ 9.0
Other	21,200	21,000	.....
Sales, Thousands of Therms	**49,293,200**	**53,562,600**	**+ 8.7**
Residential	15,253,900	15,679,000	+ 2.8
Commercial	4,392,800	4,597,000	+ 4.6
Industrial	27,272,700	30,485,100	+11.8
Other	2,373,800	2,801,500	+18.0
Revenues	**$1,960,789,000**	**$2,268,628,000**	**+15.7**
Residential	1,094,641,000	1,232,891,000	+12.6
Commercial	239,901,000	275,918,000	+15.0
Industrial	580,558,000	706,009,000	+21.6
Other	45,689,000	53,810,000	+17.8

Gross Production and Disposition of Natural Gas in U. S., by States, in 1952

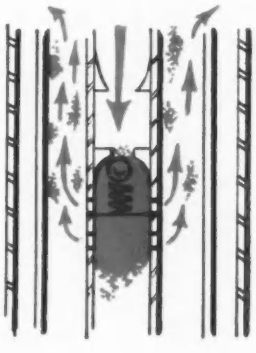
Source: U. S. Bureau of Mines Mineral Market Report No. MMS 2229, Dated Nov. 9, 1953—Data in Million Cubic Feet

STATE	ESTIMATED PRODUCTION[1]			ESTIMATED DISPOSITION		
	From Gas Wells	From Oil Wells	Total	Marketed Production[2]	Repressuring	Vented and Wasted[3]
Arkansas	40,400	27,200	67,600	42,325	22,070	3,205
California	170,000	600,300	770,300	517,450	244,450	8,400
Colorado	29,200	22,100	51,300	34,260	2,225	14,815
Illinois	900	35,000	35,900	10,183	2,369	23,348
Indiana	150	7,200	7,350	836	48	6,466
Kansas	382,000	80,300	462,300	412,544	1,197	48,559
Kentucky	70,000	4,800	74,800	73,427	.....	1,373
Louisiana	1,185,900	339,000	1,524,900	1,237,143	201,405	86,352
Maryland	2,372	.....	2,372	2,372	.....	.....
Michigan	6,600	5,000	11,600	9,052	708	1,840
Mississippi	184,200	81,500	265,700	174,100	47,605	43,995
Montana	25,900	3,400	29,300	28,714	376	210
Nebraska	4,400	1,600	6,000	5,568	48	384
New Mexico	170,700	242,000	412,700	349,229	9,005	54,466
New York	3,300	370	3,670	3,627	.....	43
North Dakota	320	1,450	1,770	369	.....	1,401
Ohio	30,900	1,700	32,600	30,993	33	1,574
Oklahoma	420,000	404,100	824,100	554,033	80,109	189,958
Pennsylvania	106,400	3,000	109,400	108,684	234	482
Texas	3,779,100	1,507,700	5,286,800	4,147,805	784,892	354,103
Utah	2,870	420	3,290	3,006	.....	284
Virginia	1,133	.....	1,133	1,133	.....	.....
West Virginia	178,500	4,700	183,200	180,995	724	1,481
Wyoming	43,800	60,500	104,300	75,313	13,003	15,984
Other States[4]	132	49	181	148	.....	33
Total, 1952	6,839,177	3,433,389	10,272,566	8,003,309	1,410,501	858,756
Total, 1951	6,481,452	3,207,920	9,689,372	7,457,359	1,438,827	793,186

[1] Marketed production plus quantities used in repressuring, vented, and wasted.
[2] Includes gas utilized, stored, and lost in transmission.
[3] Partly estimated. Includes waste on producing properties and residue blown to air.
[4] Alabama, Florida, Missouri, South Dakota, and Tennessee.

if CORROSION OR PARAFFIN IS YOUR PROBLEM—

You Need... HOLLOW SUCKER RODS



A cross-over nipple with a ball check valve is used at the bottom of the Hollow Sucker Rod string. The inhibitor or hot oil passes through the ball check valve into the annulus between tubing and rods. The valve also prevents any back flow of oil.

The use of Hollow Sucker Rods has definitely proven to be the best method to get the maximum effectiveness from any corrosion inhibitor.

With Hollow Rods you can continually inject the inhibitor into the fluid body at the top of the pump—and KNOW that both tubing and rods from pump to surface get the benefit.

By circulating hot oil through a Hollow Sucker Rod string below the maximum depth of paraffin deposits —the paraffin is melted and flushed out with the oil. This is done without shutting down the well.

Contact your nearest Wilson Supply Company Store for complete information on these rods or write.

WILSON SUPPLY COMPANY

BRANCH STORES

TEXAS—Alice, Corpus Christi, Victoria, Bay City, Columbus, Barbers Hill, Liberty, Beaumont, Kilgore, Monahans. LOUISIANA—Lake Charles, New Iberia, Houma, Harvey, Shreveport.

1301 CONTI ST.

(Corner of Walnut)

HOUSTON, TEXAS

SALES OFFICES:

Tulsa, Dallas, Corpus Christi, New Orleans, Shreveport, Lake Charles.

U. S. Production and Consumption of Natural Gas, by Years, Part 1, 1936-1945

(Source: U. S. Bureau of Mines, except as noted.)

UNITS EXPLAINED IN FOOTNOTE NO. 1

CLASSIFICATION[1]	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Production										
Wells: Gas wells drilled	2,255	2,834	2,236	2,145	2,382	2,911	2,597	2,290	3,069	3,227
Producing gas wells, Dec. 31 (dry gas)	54,500	55,050	53,770	53,530	53,880	55,500	56,150	57,200	58,780	60,600
Production: Gross Production	2,644,835	3,032,410	3,061,200	3,333,500	3,694,100	4,103,500	4,453,900	4,942,560	5,614,220	5,902,180
Source: (1). From gas wells	1,483,595	1,612,580	1,566,975	1,832,880	2,095,180	2,490,590	2,885,090	3,208,780	3,649,830	3,887,727
(2). From oil wells	1,161,240	1,419,830	1,494,225	1,500,680	1,598,920	1,612,910	1,568,810	1,733,780	1,964,390	2,014,453
Disposition: (1). Repressuring	73,507	84,925	101,551	171,401	362,916	644,379	752,619	824,803	882,979	1,061,951
(2). Vented and wasted	392,528	526,159	649,106	677,311	655,967	630,212	626,782	684,115	1,010,285	896,208
(3). Marketed production	2,167,802	2,407,620	2,295,562	2,476,756	2,660,222	2,812,658	3,053,475	3,414,689	3,711,039	3,918,686
Value at wells	119,193	123,457	113,571	120,243	120,493	138,508	154,236	176,893	189,809	191,006
Average value at wells	5.5	5.1	4.9	4.9	4.5	4.9	5.1	5.2	5.1	4.9
Underground storage: Net stored	10,998	13,706	14,981	8,032	14,995	16,251	21,024	18,953	9,917	25,335
Total stored	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total withdrawn	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interstate shipments[3]	574,343	687,428	636,626	689,795	738,844	815,672	916,969	990,457	1,029,758	1,105,760
Imports	152	289	372	131	.....	.....	.....	.....	.....	.....
Exports	7,436	4,868	1,837	3,122	5,563	7,466	8,702	11,210	14,576	18,207
Treated at natural gasoline plants	1,815,000	2,108,800	2,035,562	2,150,000	2,471,400	2,763,300	2,864,400	3,028,000	3,300,000	3,653,870
Consumption										
Residential: Volume Consumed	343,346	371,844	367,772	391,153	443,646	442,067	498,537	529,444	562,183	607,400
Number of consumers	8,017,390	8,348,390	8,633,970	8,887,460	9,245,230	9,730,110	10,134,770	10,353,870	10,668,400	10,959,060
Value at point of consumption	251,617	273,577	273,070	287,600	315,515	318,093	352,520	370,558	388,359	415,122
Average value at point of consumption	73.3	73.6	74.2	73.5	71.1	72.0	70.7	70.0	69.1	68.3
Commercial: Volume consumed	111,623	117,390	114,296	118,334	134,644	144,844	183,603	204,793	220,747	230,099
Number of consumers	656,720	679,790	704,240	715,390	741,020	766,910	778,830	811,090	845,220	888,660
Value at point of consumption	53,693	57,161	56,247	58,494	64,399	68,398	80,189	87,648	92,137	97,572
Average value at point of consumption	48.1	48.7	49.2	49.4	47.8	47.2	43.7	42.8	41.7	42.4
Industrial: Volume consumed, Total	1,705,549	1,913,807	1,812,029	1,964,278	2,076,369	2,218,281	2,362,633	2,669,242	2,913,533	3,062,980
Field	618,468	651,320	659,203	680,884	711,861	686,158	721,063	780,986	855,180	916,952
Carbon Black	283,421	341,085	324,950	347,270	368,802	365,377	335,533	315,562	355,770	431,830
Other industrial[4]	803,660	921,402	827,876	936,124	995,706	1,166,746	1,306,037	1,572,694	1,702,583	1,714,198
Petroleum refineries	93,183	113,005	109,741	97,685	128,007	148,127	201,670	243,584	315,311	338,458
Portland cement plants	36,923	40,450	37,496	40,212	41,949	54,208	64,540	51,748	35,588	38,349
Electric utility plants	156,080	170,567	169,988	191,131	183,156	205,156	238,736	305,576	359,745	326,190
Value at point of consumption, Total Industrial	170,129	196,791	171,233	187,627	197,090	233,547	258,458	300,731	313,775	321,501
Field	28,397	31,199	29,628	28,610	27,158	29,993	30,587	33,288	36,868	40,090
Carbon Black	3,681	4,294	2,892	3,263	3,702	4,135	4,338	4,624	5,763	9,854
Other industrial	138,051	161,298	138,713	155,754	166,230	199,419	223,533	262,819	271,144	271,557
Avge. value at point of consumption, Total Ind.	10.0	10.3	9.4	9.6	9.5	10.5	10.9	11.3	10.8	10.5
Field	4.6	4.8	4.5	4.2	3.8	4.4	4.2	4.3	4.3	4.4
Carbon Black	1.3	1.3	0.9	0.9	1.0	1.1	1.3	1.5	1.6	2.3
Other industrial	17.2	17.5	16.8	16.6	16.7	17.1	17.1	16.7	15.9	15.8
Total Consumption: Volume consumed	2,160,518	2,403,041	2,294,097	2,473,765	2,654,659	2,805,192	3,044,773	3,403,470	3,696,463	3,900,479
Value at point of consumption	475,439	527,529	500,550	533,721	577,004	620,038	691,167	758,937	794,271	834,195
Average value at point of consumption	22.0	22.0	21.8	21.6	21.7	22.1	22.7	22.3	21.5	21.4

U. S. Production and Consumption of Natural Gas, by Years, Part 2, 1946-1953

CLASSIFICATION[1]	1946	1947	1948	1949	1950	1951	1952	[5]1953
Production								
Wells: Gas wells drilled	3,090	3,235	2,897	2,887	2,844	[6]3,198	[6]3,345	[6]3,594
Producing gas wells, Dec. 31 (dry gas)	62,740	63,676	64,212	63,346	64,900	.....	.....	.....
Production: Gross Production	6,190,200	6,733,230	7,178,777	7,546,825	8,479,650	9,689,372	10,272,556	.....
Source: (1). From gas wells	3,807,500	3,769,768	4,588,547	4,986,126	5,603,200	6,481,452	6,839,177	.....
(2). From oil wells	2,382,700	2,963,462	2,590,230	2,560,699	2,876,450	3,207,920	3,433,389	.....
Disposition: (1). Repressuring	1,038,242	1,083,119	1,220,579	1,273,205	1,396,546	1,438,827	1,410,501	.....
(2). Vented and Wasted	1,102,033	1,067,938	1,819,178	853,884	801,044	793,186	858,756	.....
(3). Marketed production	4,030,605	[4]4,582,173	[5]5,148,020	[5]5,419,736	[6]6,282,060	[7]7,457,359	[8]8,003,309	[8]8,700,000
Value at wells	212,251	274,709	333,173	344,034	408,518	542,964	624,258	722,100
Average value at wells	5.3	6.0	6.5	6.3	6.5	7.3	7.8	8.3
Underground Storage: Net stored	19,320	9,673	57,371	65,683	54,492	138,262	166,536	212,100
Total stored	75,458	96,316	136,406	172,051	229,752	347,690	398,593	.....
Total withdrawn	56,138	86,643	79,035	106,368	175,260	209,428	232,057	.....
Interstate Shipments[3]	1,145,901	1,402,157	1,756,629	2,007,878	2,543,538	3,242,777	3,794,542	.....
Imports	.....	.....	.....	.....	.....	.....	7,807	.....
Exports	17,675	18,149	18,704	20,054	25,727	24,163	27,456	.....
Treated at natural gasoline plants	3,663,760	4,070,150	4,393,500	4,656,142	5,346,804	.....	.....	.....
Consumption								
Residential: Volume Consumed	660,820	802,150	896,348	992,544	1,198,369	1,474,725	1,621,966	1,667,400
Number of consumers	11,472,000	12,203,700	13,508,010	14,690,000	16,906,000	21,444,000	22,569,000	24,285,000
Value at point of consumption	447,018	526,355	585,188	665,536	826,393	1,120,791	1,347,854	1,517,684
Average value at point of consumption	67.6	65.6	65.3	67.1	69.0	76.0	83.1	91.0
Commercial: Volume consumed	241,802	285,213	323,054	347,818	387,838	464,309	515,669	539,400
Number of consumers	965,000	1,039,080	1,145,060	1,231,000	1,347,000	1,614,000	1,855,000	1,997,000
Value at point of consumption	102,566	125,844	142,170	158,105	184,430	245,619	293,931	338,021
Average value at point of consumption	42.4	44.1	44.0	45.5	47.6	52.9	57.0	62.7
Industrial: Volume consumed, Total	3,110,308	3,339,181	3,725,747	3,855,122	4,440,197	5,163,528	5,475,843	6,069,000
Field	897,809	933,761	1,021,513	1,059,628	1,187,473	1,441,870	1,483,754	1,644,500
Carbon Black	478,349	484,882	480,646	427,892	410,852	426,423	368,399	408,300
Other industrial[4]	1,734,150	1,920,538	2,223,588	2,367,602	2,841,872	3,295,235	3,623,690	4,016,200
Petroleum refineries	331,520	363,892	441,470	422,357	455,096	537,774	536,402	594,500
Portland cement plants	58,004	60,499	72,139	84,521	96,986	.....	.....	.....
Electric utility plants	306,924	373,037	478,097	550,121	628,919	.....	.....	.....
Value at point of consumption, Total Industrial	332,772	376,119	466,201	496,948	593,218	752,264	885,890	1,068,815
Field	41,317	49,835	61,123	65,210	73,301	97,429	115,371	.....
Carbon Black	14,470	17,316	22,723	20,355	19,677	.....	.....	.....
Other industrial	276,985	308,968	382,355	411,383	500,240	.....	.....	.....
Average value at point of consumption, Total Industrial	10.7	11.3	12.5	12.9	13.4	14.6	16.2	17.6
Field	4.6	5.3	6.0	6.2	6.2	6.8	7.8	.....
Carbon Black	3.0	3.6	4.7	4.8	4.8	.....	.....	.....
Other industrial	16.0	16.1	17.2	17.4	17.6	.....	.....	.....
Total Consumption: Volume consumed	4,012,930	4,426,544	4,945,149	5,195,484	6,026,404	7,102,562	7,613,478	8,275,800
Value at point of consumption	882,356	1,028,318	1,193,559	1,320,589	1,604,041	2,118,674	2,527,675	2,924,520
Average value at point of consumption	22.0	23.2	24.1	25.4	26.6	29.8	33.2	35.3

[1] Units—Volume: million cubic feet. No. of consumers: actual. Value: thousand dollars. Average Value: cents per Mcf. [2] Includes gas stored and lost in transmission.
[3] Includes exports. [4] Petroleum refineries, portland cement plants, and electric utility plants included in "Other Industrial". [5] Estimated with aid of reports of Bureau of Mines and American Gas Association. [6] WORLD OIL statistics.

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EXCLUSIVE DISTRIBUTORS FOR WAUKESHA PRODUCTS IN TEXAS, LOUISIANA AND NEW MEXICO

United States Marketed Production of Natural Gas, By States, By Years, Part 1

(Millions of Cubic Feet)

Sources: U. S. Bureau of Mines, except for some figures for early years which are from "Petroleum in the United States and Possessions" by Ralph Arnold and William Kemnitzer, and except where otherwise indicated by footnotes.

YEAR	Alabama	Arkansas	California	Colorado	Florida	Illinois	Indiana	Kansas	Kentucky	Louisiana	Maryland	Michigan	Mississippi	Missouri	Montana	Nebraska	New Mexico	New York
*Pre-1906	.....	281	9,810	631	.....	1,505	471,800	81,865	13,243	31	.....	.....	.....	*613	.....	.....	.....	31,340
1906	.....	21	153	23	.....	410	7,861	69,323	789	39	.....	.....	.....	34	.....	.....	.....	2,548
1907	.....	*570	230	57	.....	1,155	6,624	76,707	1,303	88	.....	.....	.....	108	.....	.....	.....	3,288
1908	.....	*1,208	479	50	.....	4,979	5,256	80,740	1,430	252	.....	.....	.....	152	.....	.....	.....	3,843
1909	.....	*1,778	2,324	*45	.....	8,473	6,159	75,074	2,097	1,365	.....	1	.....	49	.....	.....	.....	4,696
1910	.....	*2,412	2,764	*40	.....	6,723	5,760	59,380	1,357	4,110	.....	1	.....	47	.....	.....	.....	6,010
1911	.....	*1,994	6,390	*35	.....	6,762	4,365	38,800	1,275	9,786	.....	2	.....	50	.....	.....	.....	5,240
1912	.....	*1,465	9,355	*30	.....	5,603	3,618	28,068	1,951	14,493	.....	2	.....	53	.....	.....	.....	8,626
1913	.....	*806	11,035	*27	.....	4,767	2,921	22,884	1,821	26,653	.....	2	.....	21	.....	.....	.....	8,515
1914	.....	*633	17,829	*24	.....	3,548	2,580	22,628	1,422	26,745	.....	2	.....	18	.....	.....	.....	8,935
1915	.....	992	21,891	*21	.....	2,690	2,261	27,046	1,667	25,540	.....	2	.....	27	6	.....	.....	7,977
1916	.....	2,388	31,643	*18	.....	3,534	1,715	31,710	2,107	32,081	.....	1	.....	69	213	.....	.....	8,036
1917	.....	5,610	49,427	*14	.....	4,439	1,712	24,439	2,802	31,287	.....	1	.....	31	334	.....	.....	8,372
1918	.....	5,295	39,719	10	.....	4,473	1,667	27,825	3,022	36,094	.....	1	.....	22	177	.....	.....	8,461
1919	.....	5,587	55,607	10	.....	3,825	1,407	16,150	2,057	47,062	.....	1	.....	5	858	.....	.....	8,124
1920	.....	9,027	66,041	9	.....	3,013	1,779	21,158	3,345	58,274	.....	1	.....	4	818	.....	.....	8,419
1921	.....	4,260	75,942	4	.....	2,646	1,066	15,717	4,820	58,004	.....	1	.....	4	336	.....	.....	6,583
1922	.....	9,700	84,580	4	.....	3,383	947	20,289	5,872	70,267	.....	1	.....	3	486	.....	.....	6,947
1923	.....	24,215	131,434	1	.....	4,049	880	30,913	11,953	112,031	.....	1	.....	17	1,470	.....	.....	6,497
1924	.....	33,616	189,692	48	.....	4,072	998	25,580	12,875	160,945	.....	1	.....	71	1,071	.....	.....	6,196
1925	.....	41,878	187,789	574	.....	4,165	1,168	26,917	10,770	152,620	.....	1	.....	34	1,496	.....	.....	6,210
1926	.....	43,566	204,915	554	.....	3,808	901	38,095	10,410	157,423	.....	1	.....	1	2,283	.....	921	7,027
1927	.....	30,450	212,364	1,725	.....	3,741	1,124	42,646	10,206	186,961	.....	1	.....	1	4,253	.....	1,019	5,908
1928	.....	20,235	246,215	2,931	.....	3,051	1,290	45,644	15,383	227,821	.....	469	.....	360	6,277	.....	838	7,224
1929	.....	19,928	342,214	2,787	.....	2,983	1,012	38,469	27,588	261,138	.....	4,526	90	324	9,639	.....	3,054	8,387
1930	.....	18,585	334,789	3,312	.....	2,890	1,217	37,630	28,023	278,341	.....	2,075	179	1,064	10,060	.....	9,497	9,624
1931	.....	13,300	305,930	2,536	.....	2,130	1,337	38,742	27,870	224,155	.....	472	6,048	1,534	10,949	.....	19,354	7,868
1932	.....	10,235	263,484	2,547	.....	1,769	1,349	40,690	29,005	201,561	.....	968	8,648	932	13,295	.....	17,604	8,813
1933	.....	8,288	259,799	2,449	.....	1,631	1,544	41,596	31,380	197,826	.....	1,528	8,679	673	14,391	.....	19,148	6,865
1934	.....	7,024	268,122	2,633	.....	1,868	1,802	46,909	33,124	225,713	.....	2,789	8,245	549	14,971	.....	24,075	6,278
1935	.....	6,167	284,109	2,843	.....	1,448	1,777	57,125	39,738	249,450	.....	4,203	9,643	609	19,870	.....	27,931	8,288
1936	.....	8,500	320,406	3,687	.....	865	2,241	69,178	43,903	290,151	.....	7,167	11,821	399	23,003	.....	33,928	12,431
1937	.....	9,690	329,769	3,186	.....	1,040	1,551	83,890	55,719	315,301	.....	9,080	13,348	444	24,765	.....	46,337	21,325
1938	.....	11,301	315,168	1,904	.....	1,169	1,299	75,203	46,163	283,899	.....	10,165	13,656	1,369	21,216	.....	50,706	39,402
1939	.....	10,107	348,361	2,015	.....	2,746	791	80,556	47,771	294,370	.....	10,726	14,527	538	23,178	.....	60,284	29,222
1940	.....	14,379	351,950	2,533	.....	8,359	1,137	90,003	53,056	343,191	.....	12,648	6,365	310	26,231	.....	63,990	12,187
1941	.....	19,148	374,905	3,256	.....	10,053	1,522	111,121	69,067	403,855	.....	13,916	4,268	196	28,499	.....	64,655	10,456
1942	.....	19,456	403,968	4,865	.....	14,484	1,599	112,921	80,089	447,686	.....	15,521	2,082	100	31,475	.....	78,164	8,718
1943	.....	36,469	457,757	6,445	.....	18,120	1,450	133,729	92,364	505,294	.....	18,006	1,461	124	31,562	.....	86,500	8,062
1944	.....	46,453	502,017	5,141	6	18,137	1,014	157,733	94,223	534,688	.....	19,653	1,352	159	32,102	.....	87,727	7,052
1945	.....	46,600	502,442	4,914	6	16,663	1,543	145,959	81,714	542,789	.....	21,874	4,587	90	31,829	.....	105,023	9,210
1946	.....	45,177	487,904	6,728	6	17,166	1,094	165,725	70,396	525,178	.....	20,879	7,225	40	30,413	.....	119,262	5,084
†*1947*	.....	*50,440*	*544,950*	*8,250*	.....	*16,679*	*666*	*202,177*	*80,040*	*573,151*	.....	*25,479*	*39,987*	*33*	*32,549*	.....	*142,566*	*4,776*
‡1947	.....	50,630	560,510	8,302	8	17,023	877	209,231	96,459	581,398	.....	18,812	40,037	38	34,282	.....	142,740	4,600
1948	.....	53,946	570,954	8,967	27	14,062	553	245,189	70,095	686,061	.....	14,981	59,899	27	36,551	.....	194,749	4,705
1949	.....	47,788	550,903	8,490	39	12,391	334	294,078	51,851	732,845	.....	14,753	68,662	24	35,291	.....	204,961	3,693
1950	2	48,047	558,398	11,168	.....	13,285	956	364,024	73,316	831,771	373	11,250	114,153	21	39,186	17	212,909	3,336
1951	1	44,656	566,751	14,128	10	11,425	845	417,538	76,097	1,054,199	3,422	11,194	158,845	14	36,424	3,895	300,169	3,214
1952	4	42,325	517,450	34,260	15	10,183	836	412,544	73,427	1,237,143	2,372	9,052	174,100	16	28,714	5,568	349,229	3,627
*1953	5	45,200	579,700	38,800	10	9,200	900	448,000	75,300	1,195,100	1,190	9,100	169,100	15	29,700	4,685	403,400	2,500
Total	12	934,386	12,015,388	194,871	127	305,904	566,439	4,867,471	1,591,715	13,883,105	7,357	265,831	906,420	11,403	657,994	14,165	2,728,174	429,969

* Estimate.

† Old basis, as in prior years; excludes gas stored and lost in transmission; not included below in totals.

‡ New basis, as in subsequent years; includes gas stored and lost in transmission; included below in totals.

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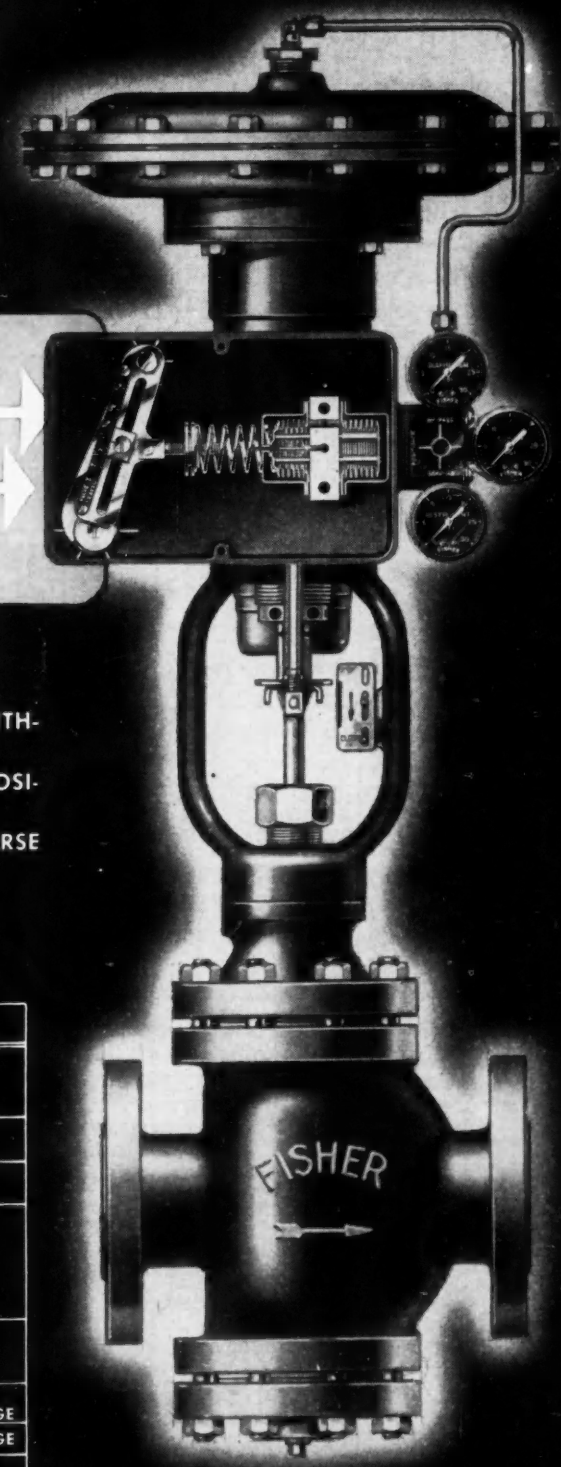

FOR ACCURATE POSITIVE VALVE POSITIONING

FEATURES

- COMPACT — SIMPLE RUGGED
- 5 YEARS FIELD SERVICE
- EASILY ADJUSTABLE
- FORCE BALANCE TYPE OF POSITIONER
- AVAILABLE WITH OR WITHOUT BY-PASS
- USABLE AS REMOTE POSITION INDICATOR
- FOR DIRECT OR REVERSE ACTION VALVES

TECHNICAL DATA

TEST			FISHER TYPE 3500
INSTRUMENT PRESSURE SENSITIVITY CONTROLLING PRESSURE CHANGE NEEDED TO PRODUCE 2 LBS. TO 15 LBS. TO DIAPHRAGM			0.07 LB
STEM MOVEMENT SENSITIVITY AMOUNT STEM CHANGE TO PRODUCE 2 LBS. TO 15 LBS. TO DIAPHRAGM	½" TRAVEL		0.0037" AVE.
	2" TRAVEL		0.015" AVE.
SPEED TIME IN SECONDS FOR FULL TRAVEL	SIZE	TRAVEL	
	DD	¾"	1.2 — 1.2 SEC.
	FF	1½"	4.2 TO 4.8 SEC.
	GG	2"	7.2 SPC TO 9.6 SEC.
	HH	2"	10.5 TO 12.6 SEC.
LAG ERROR IN POSITION AT 9 LBS. CONTROLLER PRESSURE	½" TRAVEL		0.0006" AVE.
	2" TRAVEL		0.001" AVE.
EFFECT OF VARIATIONS IN AIR SUPPLY PRESSURE	½" TRAVEL		0.1 LB. PER 5 LB. CHANGE
	2" TRAVEL		0.1 LB. PER 5 LB. CHANGE
CHARACTERISTICS CONTROLLED P VS DIAPHRAGM P			LINEAR
COMMENTS			STABLE ADJUSTMENTS ALL EASY AND SIMPLE
AIR CONSUMPTION NORMAL 9 LBS. DIAPHRAGM PRESSURE			15.0 CU FT/HR

FOR COMPLETE DETAILS WRITE FOR BULLETIN E-3500.

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Since 1880

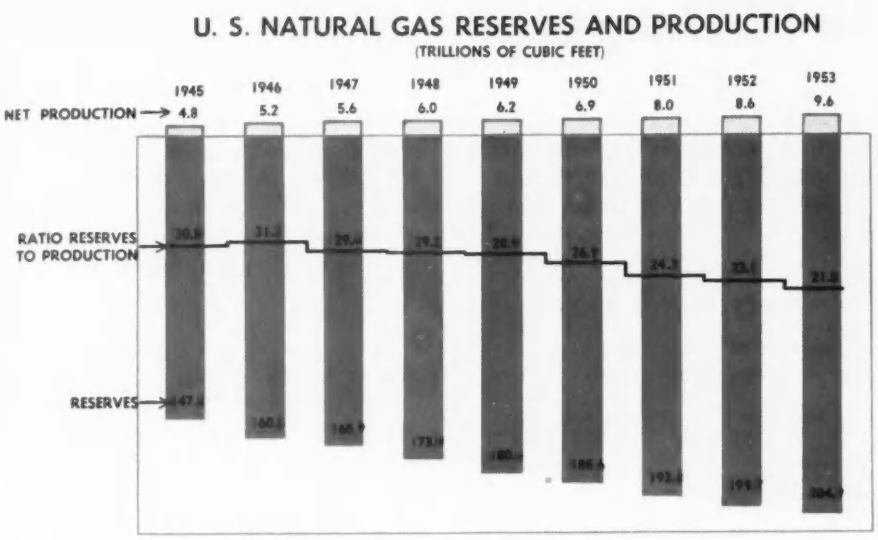
United States Marketed Production of Natural Gas, By States, By Years, Part 2

(Millions of Cubic Feet)

Sources: U. S. Bureau of Mines, except for some figures for early years which are from "Petroleum in the United States and Possessions" by Ralph Arnold and William Kemnitzer, and except where otherwise indicated by footnotes.

YEAR	North Dakota	Ohio	Oklahoma	Pennsylvania	South Dakota	Tennessee	Texas	Utah	Virginia	Washington	West Virginia	Wyoming	Others	Total United States	Value at Wells $1,000	Value at Wells ¢ Mcf.	Cost to Users $1,000	Cost to Users ¢ Mcf.
*Pre-1906	.....	305,593	2,215	1,611,066	.....	*1	815	*150	.....	.....	387,799	506	42,517	**2,961,781**	.....	.....	426,448	14.4
1906	.....	45,436	3,520	138,161	23	2	*1,000	.....	.....	.....	119,400	*100	.....	**388,843**	.....	.....	46,874	12.1
1907	2	52,041	4,867	135,516	37	2	*1,200	.....	.....	.....	122,687	*140	.....	**406,622**	.....	.....	54,222	13.3
1908	10	47,442	11,925	130,476	36	2	*1,500	.....	.....	.....	112,181	*180	.....	**402,141**	.....	.....	54,640	13.6
1909	8	53,223	28,037	127,697	23	2	*3,000	.....	.....	.....	166,435	*220	.....	**480,706**	.....	.....	63,207	13.1
1910	19	48,232	50,430	126,867	43	1	*4,000	.....	.....	.....	190,706	*253	.....	**509,155**	.....	.....	70,756	13.9
1911	13	49,450	67,276	108,869	26	1	5,503	.....	.....	.....	206,891	*265	.....	**512,993**	.....	.....	74,622	14.5
1912	*18	56,210	73,799	112,150	*36	2	7,470	.....	.....	.....	239,007	*247	.....	**562,203**	.....	.....	84,564	15.0
1913	*22	50,612	75,018	118,860	*45	2	12,160	.....	.....	.....	245,454	*273	.....	**581,898**	.....	.....	87,847	15.1
1914	*20	68,270	78,167	110,745	*41	1	13,434	.....	.....	.....	236,489	*306	.....	**591,867**	.....	.....	94,116	15.9
1915	*36	79,510	87,517	113,692	*53	2	13,324	.....	.....	.....	244,604	*321	.....	**628,579**	.....	.....	101,312	16.1
1916	*35	69,888	123,517	130,484	*43	2	15,810	.....	.....	.....	299,319	*557	.....	**753,170**	.....	.....	120,227	16.0
1917	*27	68,917	137,384	133,397	*33	11	17,047	.....	.....	.....	308,617	*1,209	.....	**795,110**	.....	.....	142,089	17.9
1918	35	61,261	124,317	123,813	42	1,827	13,440	.....	.....	.....	265,161	4,339	.....	**721,001**	.....	.....	153,554	21.3
1919	2	63,154	163,649	113,489	33	77	24,710	.....	.....	.....	234,095	6,014	.....	**745,916**	.....	.....	160,888	21.6
1920	1	58,938	154,467	125,787	20	15	37,063	.....	.....	.....	239,719	10,312	.....	**798,210**	.....	.....	196,194	24.6
1921	1	47,412	124,058	86,144	10	11	44,504	.....	.....	.....	174,921	15,608	.....	**662,052**	.....	.....	174,617	26.4
1922	1	51,481	140,631	101,276	15	3	47,945	.....	.....	.....	195,288	23,427	.....	**762,546**	84,873	11.1	221,535	29.1
1923	.....	53,812	203,082	112,562	33	4	74,535	.....	.....	.....	203,867	35,523	97	**1,006,976**	100,849	10.0	240,001	23.8
1924	.....	47,396	214,452	105,863	3	1	107,247	.....	.....	.....	182,285	46,036	73	**1,141,521**	105,779	9.3	253,856	22.2
1925	.....	43,235	249,285	101,632	4	9	134,872	.....	.....	.....	180,345	45,539	28	**1,188,571**	112,047	9.4	265,271	22.3
1926	.....	47,363	286,421	107,089	10	11	175,392	.....	.....	.....	180,223	46,567	38	**1,313,019**	124,693	9.5	300,168	22.9
1927	.....	51,381	326,864	105,709	92	9	254,063	927	.....	.....	162,375	43,582	27	**1,445,428**	127,468	8.8	317,930	22.0
1928	.....	56,341	320,861	99,466	54	.....	301,990	1,105	.....	.....	163,018	47,490	76	**1,568,139**	139,898	8.9	363,726	23.2
1929	.....	57,936	357,893	101,951	99	25	464,928	693	.....	.....	167,333	44,648	28	**1,917,693**	157,596	8.2	413,276	21.6
1930	.....	63,394	348,116	88,706	98	24	517,880	393	.....	.....	144,180	43,219	125	**1,943,421**	147,048	7.6	416,090	21.4
1931	.....	56,326	263,685	74,737	12	25	464,580	219	.....	.....	124,797	39,770	.....	**1,686,436**	117,505	7.0	392,816	23.3
1932	.....	51,466	255,487	61,611	10	22	456,832	184	.....	.....	100,540	28,938	.....	**1,555,990**	98,985	6.4	384,632	24.7
1933	.....	47,929	245,759	63,579	10	48	475,691	48	.....	111	100,653	25,830	‡ 19	**1,555,474**	97,096	6.2	368,540	23.7
1934	.....	50,330	254,457	86,238	11	12	602,976	182	.....	104	109,161	23,148	.....	**1,770,721**	106,438	6.0	395,378	22.3
1935	.....	49,592	274,313	94,464	8	..	642,366	98	.....	138	115,772	26,643	.....	**1,916,595**	110,402	5.8	329,374	22.4
1936	.....	46,994	280,481	110,362	9	84	734,561	92	.....	141	138,076	29,322	.....	**2,167,802**	119,193	5.5	476,813	22.0
1937	.....	42,783	296,260	115,928	10	17	854,561	2,366	.....	143	149,084	31,023	.....	**2,407,620**	123,457	5.1	528,354	21.9
1938	71	35,257	263,164	76,547	10	6	882,473	4,277	.....	117	134,342	26,678	.....	**2,295,562**	113,571	4.9	500,698	21.8
1939	76	36,469	250,875	93,882	10	8	979,427	4,854	60	63	159,226	26,614	.....	**2,476,756**	120,243	4.9	534,240	21.6
1940	.....	40,639	257,626	90,725	9	9	1,063,538	5,124	80	36	188,751	27,346	.....	**2,660,222**	120,493	4.5	577,939	21.7
1941	47	41,858	234,054	92,819	7	10	1,086,312	5,567	106	1	207,681	29,284	.....	**2,812,658**	138,508	4.9	621,333	22.1
1942	122	45,055	269,704	93,532	7	10	1,170,345	5,163	92	.....	215,193	33,124	.....	**3,053,475**	154,236	5.1	692,737	22.7
1943	177	52,001	285,045	93,543	6	10	1,323,885	4,464	77	.....	223,787	34,351	.....	**3,414,689**	176,893	5.2	760,950	22.3
1944	200	51,724	310,888	92,987	5	10	1,525,515	6,223	57	.....	181,452	34,521	.....	**3,711,039**	189,809	5.1	794,271	21.5
1945	217	49,967	357,530	82,188	5	10	1,711,401	6,562	56	.....	160,225	35,282	.....	**3,918,686**	191,006	4.9	834,195	21.4
1946	344	61,570	380,938	92,443	5	47	1,776,148	4,252	57	.....	178,958	33,266	.....	**4,030,605**	212,251	5.3	882,356	22.0
†*1947*	.....	*73,989*	*393 216*	*94,252*	.....	*80*	*1,932 857*	.....	.....	.....	*182.0"2*	*40,083*	*6,392*	*4,444,693*	*266,682*	*6.0*	*1,031,169*	*23 2*
‡1947	442	68,946	419,010	91,971	6	80	1,992,704	6,040	64	.....	192,233	45,550	.....	**4,582,173**	274,709	6.0	1,028,318	23.2
1948	643	65,619	480,573	87,578	2	127	2,289,923	6,610	74	.....	203,681	52,424	.....	**5,148,020**	333,173	6.5	1,193,559	24.1
1949	533	46,512	435,262	84,739	1	83	2,588,921	6,126	65	.....	181,176	50,815	.....	**5,419,736**	341,443	6.3	1,320,671	25.4
1950	.....	43,163	482,360	91,137	.....	132	3,126,402	.....	.....	.....	189,980	62,062	4,612	**6,282,060**	408,776	6.5	1,597,930	26.5
1951	◎463	38,879	538,756	128,715	◎	132	3,781,136	⧗	64	.....	191,146	⧗75,241	.....	**7,457,359**	542,964	7.3	2,118,674	29.8
1952	◎375	30,993	554,033	108,684	◎	107	4,147,805	3,006	1,133	.....	180,995	75,313	.....	**8,003,309**	624,258	7.8	2,527,675	33.2
1953	◎500	31,000	652,300	84,200	◎	95	4,649,700	3,400	500	.....	181,000	85,400	.....	**8,700,000**	722,100	8.3	2,924,520	35.3
Total	4,460	2,783,000	11,800,328	6,564,136	1,095	3,131	40,622,034	78,120	2,485	854	9,179,708	1,348,826	47,640	**111,816,548**	§	§	26,784,003	24.0

* Estimate. † Old basis, as in prior years; excludes gas stored and lost in transmission; not included below in totals. ‡ New basis, as in subsequent years; includes gas stored and lost in transmission; included below in totals. § Not available. ⧗ Wyoming includes Utah. ◎ North Dakota includes South Dakota. ‡ Others in 1933: Alaska.



Natural Gas Reserves . . . U. S.

still finding more natural gas than is being produced.

DESPITE AN AMAZING growth in production during recent years, the U. S. still is finding more natural gas and natural gas liquids than it is producing. Consequently, the nation's proved producible reserves of both natural gas and natural gas liquids continue to rise to new all-time peaks.

Proved reserves of natural gas in the U. S. at the end of 1953 are estimated at 204.9 trillion cubic feet, an increase of over 5 trillion from the 199.7 trillion cubic feet which existed at the end of 1952. This big growth was the result of finding an aditional 14½ trillion cubic feet during the year, while production was only 9½ trillion cubic feet.

The nation's proved reserves of natural gas liquids are estimated at 5.4 billion barrels at the close of 1953, a gain of 374.7 million barrels during the year. In contrast with the discovery of an estimated 682.1 million barrels of new natural gas liquids (condensate, natural gasoline and liquefied petroleum gas), production during the year was only 307.4 million barrels.

Big Growth. U. S. reserves of natural gas have risen steadily and sharply in recent years. The 204.8 trillion cubic feet of proved reserves on hand at the end of 1953 contrasted with 180.3 trillion cubic feet at the close of 1949, and 147.7 trillion cubic feet on December 31, 1945.

This represents an amazing increase in view of the huge growth in producing rates during this period. Net production of natural gas has doubled since 1945, when 4.8 trillion cubic feet were produced. By 1949, production had risen to 6.2 trillion cubic feet, and to 9.5 trillion cubic feet in 1953.

From the end of 1945 through the close of 1953, the U. S. produced 56.1 trillion cubic feet of natural gas. During this same period, the country's estimated proved reserves of gas increased by 57.1 trillion cubic feet, indicating the discovery of 113.2 trillion cubic feet of gas.

U. S. proved reserves of 5.4 billion barrels of natural gas liquids at the end of 1953 compared with 3.7 at the close of 1949, and 3.2 at the end of 1946. This increase in reserves has been achieved although production has risen from an annual total of 129.3 million barrels in 1946, to the 1953 peak of 307.4 million barrels.

Large Future Needs. The U. S. will continue to use increasing quantities of natural gas in the future. Accord-

U. S. Reserves of Natural Gas and Natural Gas Liquids, by Years

Sources: AGA and API except 1953 estimated by WORLD OIL . . . Natural gas data in millions of cubic feet, 14.65 psi at 60° F. . . . Natural gas liquids in thousands of barrels.

		CHANGES IN RESERVES DURING YEAR							
		(Add) Reserves Proved							
YEAR	Estimated Proved Reserves Beginning of Year	Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Total Reserves Proved During Year (Cols. 2+3)	(Add or Deduct) Net Change in Storage	(Deduct) Net Production During Year	(Net Change) Increase or Decrease (Cols. 4+ 5—6)	Estimated Proved Reserves End of Year (Cols. 1+7)	Ratio of Year-End Reserves to Year's Prod. (Year's Supply) Col. 8÷ Col. 6
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Natural Gas:									
1945								147,789,367	
1946	147,789,367			17,729,152	*	4,942,617	+12,786,535	160,575,901	32.5
1947	160,575,901	7,570,654	3,410,170	10,980,824	*	5,629,811	+5,351,013	165,926,914	29.5
1948	165,926,914	9,769,483	4,129,089	13,898,572	+51,482	6,007,628	+7,942,426	173,869,340	28.9
1949	173,869,340	8,061,429	4,612,870	12,674,299	+82,746	6,245,041	+6,512,004	180,381,344	28.9
1950	180,381,344	9,172,381	2,877,351	12,049,732	+54,301	6,892,678	+5,211,355	185,592,699	26.9
1951	185,592,699	13,013,606	3,039,385	16,052,991	+132,751	7,966,941	+8,218,801	193,811,500	24.3
1952	193,811,500	8,934,470	5,411,043	14,345,513	+198,850	8,639,638	+5,904,725	199,716,225	23.1
†1953	199,716,225			14,500,000	+212,000	9,550,000	+5,162,000	204,878,225	21.5
Natural Gas Liquids:									
1946						129,262		3,163,219	24.5
1947	3,163,219	192,237	59,301	251,538		160,782	+ 90,756	3,253,975	20.2
1948	3,253,975	405,874	64,683	470,557		183,749	+286,808	3,540,783	19.3
1949	3,540,783	294,211	92,565	386,776		198,547	+188,229	3,729,012	18.8
1950	3,729,012	707,879	58,183	766,062		227,411	+538,651	4,267,663	18.8
1951	4,276,663	648,497	75,494	723,911		267,052	+456,939	4,724,602	17.7
1952	4,724,602	475,170	81,668	556,838		284,789	+272,049	4,996,651	17.5
†1953	4,996,651			682,126		‡307,420	+374,706	5,371,357	17.5

* Not Estimated. † Estimated by WORLD OIL. ‡ Includes 242,363 plant production of natural gasoline, etc.; 33,557 lease condensate; estimated 31,500 losses and waste.

ing to some forecasts, natural gas consumption will be 2½ times larger than 1953 rates by 1975. Consequently, the industry is faced with the need of finding larger amounts of gas in the future.

Heretofore, the industry has depended upon the incidental discovery of gas while seeking oil to make enough supply available to meet requirements. The amounts needed now have become so great, the industry no longer can continue this policy. Instead, it must begin to think in terms of natural gas requirements and inaugurate plans for finding gas as well as oil.

The situation is further emphasized by most of the major gas reserves known today being committed or in the process of being committed to supply specified market. Consequently, the industry will need to consider natural gas discovery and producing requirements, in addition to those of oil, in planning its future exploratory operations.

Texas Leads. Texas has more than half of the nation's recoverable natural gas reserves, holding approximately the same position that it does in crude oil reserves. Latest reserve figures available by states is as of Dec. 31, 1952. At that time Texas was credited with having 105.7 trillion cubic feet of the 199.7 trillion cubic feet in the nation.

Louisiana followed with reserves of 31.4 trillion cubic feet, followed by Kansas and New Mexico with 14 trillion cubic feet each.

Estimated Proved Recoverable Reserves of Natural Gas in U. S., by States

Source: American Gas Association
(Millions of Cubic Feet—14.65 psia, at 60 Deg. F)

STATE	Reserves as of Dec. 31, 1951	CHANGES IN RESERVES DURING 1952: Extensions and Revisions[2]	Discoveries of New Fields and New Pools in Old Fields[2]	Net Change in Underground Storage[3]	Net Production[4]	RESERVES AS OF DECEMBER 31, 1952: Total (Columns 7+8+9+10, Also Columns 1+2+3+4 Less Column 5)	Non-Associated[5]	Associated[6]	Dissolved[7]	Underground Storage[8]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ark.	931,314	91,070	3,020	630	41,452	984,582	528,029	138,462	315,465	2,626
[9]Calif.	9,482,445	269,427	65,938	(—)1,925	475,863	9,340,022	2,516,241	2,156,918	4,653,946	12,917
Colo.	1,138,451	31,851	42,181	0	48,234	1,164,249	524,113	39,286	600,850	0
Illinois	227,133	14,750	1,768	0	32,000	211,651	4,251	5,000	202,400	0
Indiana	30,807	9,990	1,472	1,790	7,345	36,714	3,552	3,100	27,225	2,837
Kansas	13,457,498	1,167,567	21,912	1,110	454,522	14,193,565	13,707,255	132,627	320,946	32,737
Kentucky	1,325,588	46,696	11,360	2,379	72,500	1,313,523	1,240,‡7	0	59,080	13,564
[9]Louisiana	29,005,031	2,176,296	1,540,159	0	1,269,872	31,451,614	25,000,197	4,185,548	2,265,869	0
Michigan	203,025	3,296	18,612	40,498	10,888	254,543	132,752	0	38,645	83,146
Miss.	2,439,969	21,771	118,224	417	216,321	2,364,060	1,700,671	401,453	261,479	457
Montana	828,107	12,885	17,236	2,051	32,676	827,603	697,705	36,593	83,691	9,614
Nebraska	95,810	1,264	3,964	0	7,080	93,958	64,895	7,701	21,362	0
N. Mexico	11,589,979	2,669,335	217,160	4,458	442,043	14,038,889	10,653,682	2,155,593	1,209,904	19,710
New York	66,793	200	0	5,047	3,400	68,640	47,502	0	468	20,670
Ohio	689,135	32,607	8,275	33,966	32,500	731,483	561,537	0	31,470	138,476
Oklahoma	11,804,337	547,606	199,997	13,781	800,892	11,764,829	7,273,114	951,250	3,491,935	48,530
Penn.	619,455	36,595	91,950	56,385	94,800	709,585	515,866	0	36,470	157,249
[9]Texas	105,653,229	1,459,565	2,950,264	13	4,330,308	105,732,763	69,209,845	20,462,637	16,058,448	1,833
Utah	95,845	188,045	2,802	0	3,280	283,412	265,105	0	18,307	0
W. Va.	1,671,499	108,315	23,400	26,256	169,400	1,660,070	1,470,546	0	73,285	116,239
Wyoming	2,340,298	35,660	21,379	11,994	88,207	2,321,124	1,455,746	350,249	502,443	12,696
[1]Miscl.	115,752	9,679	49,970	0	6,055	169,346	66,682	0	102,664	0
TOTAL	193,811,500	8,934,470	5,411,043	198,850	8,639,638	199,716,225	137,640,165	31,026,417	30,376,352	673,291

[1] Includes Alabama, Florida, Maryland, Missouri, North Dakota and Virginia. [2] Excludes gas loss due to natural gas liquids recovery. [3] The net difference between gas stored in and gas withdrawn from underground storage reservoirs, inclusive of adjustments. [4] Net production equals gross withdrawals less gas injected into underground reservoirs. Changes in underground storage and gas loss due to natural gas liquids recovery are excluded. December production estimated occasionally. [5] Non-associated gas is free gas not in contact with crude oil in the reservoirs. [6] Association gas is free gas in contact with crude oil in the reservoirs. [7] Dissolved gas is gas in solution with crude oil in the reservoirs. [8] Net gas placed in underground reservoirs for storage purpcses only. [9] Includes off-shore reserves.

Estimated Proved Recoverable Reserves of Natural Gas Liquids in U. S., by States

(Includes Condensate, Natural Gasoline, and Liquefied Petroleum Gas)
Sources: American Gas Association and American Petroleum Institute
(Thousands of Barrels of 42 U. S. Gallons)

STATE	Reserves as of Dec. 31, 1950	CHANGES IN RESERVES DURING 1952: Extensions and Revisions	Discoveries of New Fields and New Pools in Old Fields	Net ProductionI	RESERVES AS OF DECEMBER 31, 1952: Total (Columns 6+7+8, also Columns 1+2+3 Less Column 4)	Non-Associated	Associated	Dissolved
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Arkansas	51,050	1,013	91	1,283	50,871	29,914	6,762	14,195
*California	329,316	21,229	1,475	29,513	322,507	0	108,720	213,787
Colorado	11,910	(—) 14	0	557	11,339	299	0	11,040
Illinois	24,572	(—) 907	9	3,428	20,246	21	25	20,200
Indiana	149	50	7	37	169	18	15	136
Kansas	159,569	14,666	260	6,268	168,227	163,505	1,513	3,209
Kentucky	10,478	311	156	1,787	9,158	9,158‡	0	0
*Louisiana	684,773	48,322	17,991	37,420	713,666	567,311‡	98,413	47,942
Michigan	1,009	(—) 439	94	81	583	196	0	387
Mississippi	52,290	998	2,056	4,413	50,931	22,445	23,779	4,707
Montana	3,341	0	0	212	3,129	3,129	0	0
Nebraska	2,586	221	85	176	2,716	2,194	415	107
New Mexico	130,619	29,689	1,347	10,112	151,543	59,636	31,127	60,780
Ohio	1,710	94	11	37	1,778	1,778‡	0	0
Oklahoma	311,125	(—) 4,717	4,970	26,472	284,906	100,438	22,224	162,244
Pennsylvania	2,563	214	107	244	2,640	2,640‡	0	0
*Texas	2,877,341	350,683	52,437	155,370	3,125,091	1,390,472	459,347	1,275,272
Utah	61	0	0	4	57	57	0	0
West Virginia	23,921	658	220	5,271	19,528	19,528	0	0
Wyoming	45,886	12,948	350	2,094	57,090	38,757	18,333	0
†Miscellaneous	333	151	2	10	476	0	0	476
TOTAL	4,724,602	475,170	81,668	284,789	4,996,651	2,411,496	770,673	1,814,482

* Includes off-shore reserves. † Includes Alabama, Florida and North Dakota. ‡ Not allocated by types but occurring principally in the column shown. I Production is credited to state containing reserve when recovery is made in other states.

Estimated Proved Recoverable Reserves of Natural Gas in U. S., by Years

(Reserves estimates from sources shown; production from Bureau of Mines.)

YEAR	Reserves End of Year (Billion Cubic Feet)	Authority for Estimate of Reserves	Net Production (Billion Cubic Feet)	Ratio Reserve to Annual Prod.
1918	15,000	E. Holley Poe[1]	721	20.8
1919	15,000	" "	746	20.1
1920	15,000	" "	798	18.8
1921	15,000	" "	662	22.7
1922	15,000	" "	763	19.7
1923	15,000	" "	1,007	14.9
1924	15,000	" "	1,142	13.1
1925	23,000	*Gas Facts*[2]	1,189	19.3
1926	23,000	" "	1,313	17.5
1927	23,000	" "	1,445	15.9
1928	23,000	" "	1,568	14.7
1929	23,000	" "	1,918	12.0
1930	46,000	Earl P. Hines[3]	1,943	23.7
1931	46,000	" "	1,686	27.3
1932	46,000	" "	1,556	29.6
1933	46,000	" "	1,555	29.6
1934	62,000	Ralph E. Davis[4]	1,771	35.0
1935	62,000	" "	2,408	25.7
1936	62,000	" "	2,571	24.1
1937	66,000	" "	2,854	23.1
1938	70,000	Lyon F. Terry[5]	2,960	23.6
1939	70,000	" "	3,162	22.1
1940	85,000	Ralph E. Davis[4]	3,331	25.5
1941	113,800	P.A.W[6]	3,459	32.9
1942	110,000	"	3,701	29.7
1943	110,000	"	4,336	25.4
1944	133,500	"	4,731	28.2
1945	147,789	A.G.A.[7]	4,840	30.5
1946	160,576	"	5,152	31.2
1947	165,927	"	5,650	29.4
1948	173,869	"	5,958	29.2
1949	180,381	"	6,245	28.9
1950	185,593	"	6,893	26.9
1951	193,811	A.G.A.[7]	7,967	24.3
1952	199,716	"	8,640	23.1
1953	204,878	*World Oil*	9,550	21.5

[1] And Associates, New York, in report September 23, 1947. [2] American Gas Association yearbook, 1945 and 1946. [3] Then with Cities Service Co., New York. [4] Consulting engineer, Houston. [5] Of Chase National Bank, New York. [6] Petroleum Administration for War. [7] American Gas Association. [8] Beginning of new basis; includes gas stored and lost in transmission.

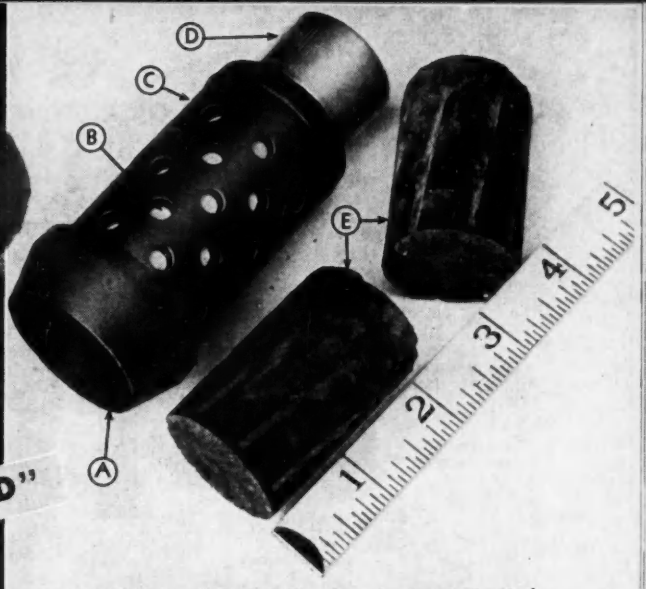
PGAC JUMBO
Side-wall Core Samples...

"SO ROUND....

SO FIRM....

SO FULLY PACKED"

(WITH APOLOGIES TO A GOOD SMOKE!)



PGAC Side Wall Coring Chamber. A—Cutter. B—Mud Extrusion Ports. C—Core Barrel. D—Powder Chamber and Retrieving Cable Housing. E—Note large size of PGAC core samples.

Why YOU should always call in PGAC to take your core samples....

1. Each PGAC core sample is taken from a *precision-determined* depth . . . because the exact position of each core barrel is *pin-pointed* by the superior accuracy of PGAC's S.P. curve on their electrical log.

2. Identification of each PGAC core sample is *positive* . . . because the firing of each core barrel is controlled by a completely separate electrical circuit . . . because a foolproof indicating circuit shows when each barrel is fired, and *which barrel* is fired . . . and because an automatic counter indicates the firing of each barrel.

3. Time after time, oil operators are amazed to see PGAC's *100% recovery of samples* — a sample in every core . . . because of the superior firing power of PGAC guns . . . because of the unequalled dependability of PGAC controls . . . and because of the 2500 lb. tensile strength cables used for *certain* barrel recovery

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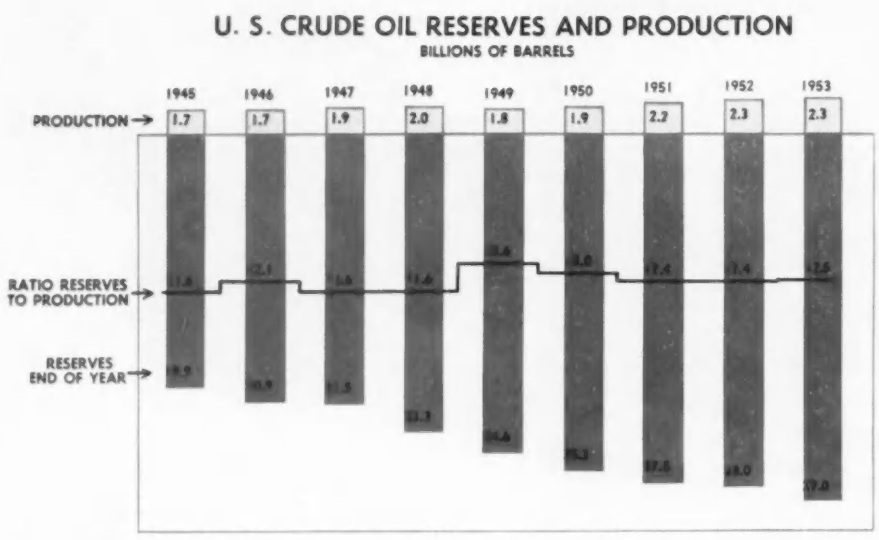

Petroleum Reserves . . . keep pace with rising production during 1953.

A RECORD VOLUME of development wells and wildcats and great technical advances made in secondary recovery techniques enabled the oil industry to more than break even in maintaining adequate petroleum reserves for the U. S. in 1953. Breaking even is no simple task. For in order to do so, the U. S. must prove up about 1½ barrels of oil for every one produced in any given year. Explanation for this is that the U. S. production of oil is steadily rising, and more oil than produced must be found to maintain normal relationship between reserves and production.

It is this economic spur which will force the oil industry to increase the tempo of drilling to an even greater height in 1954 and to channel more dollars into secondary recovery projects.

During 1953 the petroleum industry proved up 3.37 billion barrels of new crude reserves and 682 million barrels of natural gas liquids (condensate, casinghead gasoline, etc.) according to WORLD OIL estimates. This makes a total estimate of about 4 billion barrels of liquid hydrocarbons found during the year. But during this same 12-month period, the U. S. produced 2.63 billion barrels, so the net gain for the nation's unproduced reserves is 1.4 billion barrels. Added to last year's total reserve figure, which was compiled by the American Petroleum Institute, this increases the U. S. total reservoir of unproduced proved liquid hydrocarbons to 34.4 billion barrels.

This amount is 13.1 times the number of barrels which the U. S. produced in 1953. The ratio of reserves to annual production has been maintained around this same level since World War II. Since 1946, reserves have been increased enough to be always from 12 to 14 times the prevailing annual production.

New peak. U. S. Reserves of crude oil alone (exclusive of natural gas liquids) stood at the end of 1953 at a new high of 29.0 billion barrels. They showed a net increase of one billion barrels or 3.6 percent over the 28.0 billion at beginning of the year. Having proved up 3.3 billion barrels of new reserves of crude in 1953 while producing 2.3 billion, the industry developed 1.45 barrels of new reserves for each barrel produced.

The 29.0 billion barrels of crude oil reserves available in the ground at the end of 1953 were 12.5 times the amount produced during 1953. This ratio of yearend reserves to prevailing annual production was a little better than that of 12.4 at end of both 1952 and 1951. The ratio has averaged 12.3 for the past nine years, with production steadily increasing but with reserves increasing proportionally. On the average, the U. S. has consistently maintained crude reserves equivalent to 12.3 times the prevailing annual production. At the end of 1945, following World War II, crude reserves were 11.6 times the 1945 production, and the ratio then went to 12.1 at the end of 1946, 11.6 at end of 1947, 11.6 at end of 1948, 13.6 at end of 1949,

Estimated Changes in U. S. Proved Crude Oil Reserves in 1953

Reserves Jan. 1, 1953, from API; changes in 1953 estimated by WORLD OIL. Production in 1953 from Bureau of Mines except Nov.-Dec. from API . . . Data in thousands of barrels.

STATE	Jan. 1, 1953 Reserves	Reserves Proved in 1953	1953 Production	Change in Reserves in 1953	Dec. 31, 1953 Reserves	Ratio of Reserves to Prod.
Alabama	15,635	2,800	1,705	+ 1,095	**16,730**	9.8
Arkansas	352,261	57,603	29,397	+ 28,206	**380,467**	12.9
California	3,854,171	449,106	365,021	+ 84,085	**3,938,256**	10.8
Colorado	305,691	23,312	33,275	— 9,963	**295,728**	8.9
Illinois	619,461	90,865	58,976	+ 31,889	**651,350**	11.0
Indiana	55,535	14,310	13,039	+ 1,271	**56,806**	4.4
Kansas	916,989	187,772	114,198	+ 73,574	**990,563**	8.7
Kentucky	55,565	9,306	11,565	— 2,259	**53,306**	4.6
Louisiana	2,557,530	437,456	240,137	+ 197,319	**2,754,849**	11.5
Michigan	57,411	13,176	12,316	+ 860	**58,271**	4.7
Mississippi	358,809	22,509	33,936	— 11,427	**347,382**	10.2
Montana	156,181	74,880	11,748	+ 63,132	**219,313**	18.7
Nebraska	21,836	11,400	5,929	+ 5,471	**27,307**	4.6
New Mexico	733,358	86,580	70,254	+ 16,326	**749,684**	10.7
New York	52,854	2,830	3,907	— 1,077	**51,777**	13.3
North Dakota	76,203	92,950	5,108	+ 87,842	**164,045**	32.1
Ohio	27,390	3,850	3,555	+ 295	**27,685**	7.8
Oklahoma	1,557,620	374,765	202,821	+ 171,944	**1,729,564**	8.5
Pennsylvania	121,724	7,711	10,554	— 2,843	**118,881**	11.3
Texas	14,916,168	1,237,795	1,006,886	+ 230,909	**15,147,077**	15.0
Utah	42,399	13,950	1,804	+ 12,146	**54,545**	30.2
West Virginia	37,212	2,190	3,021	— 831	**36,381**	12.0
Wyoming	1,064,722	152,756	84,183	+ 68,573	**1,133,295**	13.5
*Miscellaneous	3,829	480	589	— 109	**3,720**	6.3
Total U.S.	27,960,554	3,370,352	2,323,924	+1,046,428	**29,006,982**	12.5

* Missouri, Florida, Tennessee, Virginia.

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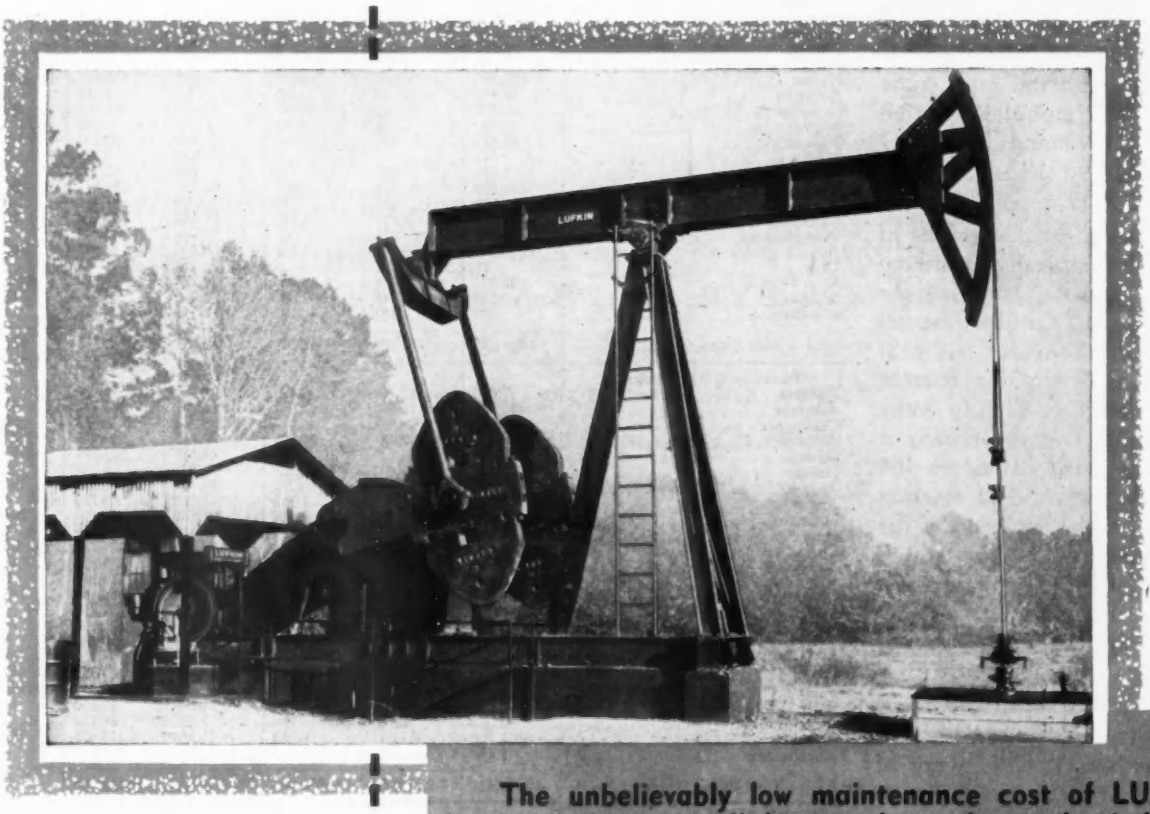

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13.0 at end of 1950, 12.4 at end of both 1951 and 1952, and 12.5 at the end of 1953.

U. S. reserves of natural gas liquids at the close of 1953 are estimated at 5.4 billion barrels. They were 375 million barrels or 7.5 percent greater than at the beginning of the year, when the total was approximately 5.0 billion barrels. Having proved up 682 million barrels of new reserves in 1953 while producing 307 million barrels of natural gasoline, condensate, and allied products, the industry developed 2.2 barrels of new reserves for each barrel produced.

The indicated 5.4 billion barrels of reserves of natural gas liquids available at the end of 1953 were 17.5 times as great as the amount produced during 1953. That was the same ratio as at the end of 1952. The ratio has been gradually coming down as larger markets for natural gasoline and liquefied petroleum gas products such as butane and propane have been developing. Reserves of natural gas liquids were 20.2 times annual production at the end of 1947, and the ratio came down to 19.3 at the end of 1948, 18.8 at end of both 1949 and 1950, 17.7 at end of 1951, and 17.5 at end of both 1952 and 1953.

One of the most notable trends of the past year naturally centered around North Dakota, heart of the Williston Basin. Crude reserves proved up in this state for the year are estimated at 93 million barrels, while production was slightly more than 5 million. The total estimate of proved reserves now stands at 164 million, making the ratio of reserves to production 32 to 1. But end of the year saw completion of the state's first pipe line, and 1954 should see a sharp increase in production as well as a further expansion of proved reserves.

Another important development during the past year which will affect future reserves was the discovery of oil in commercial quantities in South Dakota as the year ended. This gives the U. S. its 28th oil-producing state.

Texas, the nation's No. 1 oil reservoir, is again back on the plus side of the production vs reserve proving balance after slipping badly during 1952, when the state produced 151 million barrels of crude more than was proved up.

(SEE TABLE ON PAGE 170)

Estimated Proved Reserves of Crude Oil, Natural Gas Liquids, and Total Hydrocarbons in U. S., by States, and Western Canada, by Provinces

(Sources: For U. S., crude oil from American Petroleum Institute and natural gas liquids from API and American Gas Ass'n. For Canada, all data via API from Canadian Petroleum Ass'n.)

(THOUSANDS OF BARRELS)

STATE or PROVINCE	Proved Reserves Dec 31, 1951	Added in 1952 by Extensions and Revisions	[1]Discovered in 1952 in New Fields and in New Pools in Old Fields	Production During 1952	Reserves Dec 31, 1952 (Columns 1 + 2 + 3 Less Column 4)	Net Change in Reserves During 1952 (Column 5 Less Column 1)
	(1)	(2)	(3)	(4)	(5)	(6)
UNITED STATES						
Crude Oil						
Alabama	7,860	460	8,400	1,085	15,635	7,775
Arkansas	336,458	41,007	2,340	27,544	352,261	15,803
[2]California	3,760,870	409,209	43,542	359,450	3,854,171	93,301
Colorado	325,178	2,468	8,435	30,390	305,691	(—) 19,487
Illinois	646,335	30,334	3,802	61,010	619,461	(—) 26,874
Indiana	50,667	14,552	2,187	11,871	55,535	4,868
Kansas	791,946	213,246	25,942	114,145	916,989	125,043
Kentucky	58,549	6,999	1,806	11,789	55,565	(—) 2,984
[2]Louisiana	2,284,781	406,553	92,643	226,447	2,557,530	272,749
Michigan	64,113	5,282	1,385	13,369	57,411	(—) 6,702
Mississippi	385,387	3,526	4,408	34,512	358,809	(—) 26,578
Montana	108,418	30,272	27,150	9,659	156,181	47,763
Nebraska	15,918	2,079	6,228	2,389	21,836	5,918
New Mexico	611,640	158,663	22,905	59,850	733,358	121,718
New York	57,061	.....	.....	4,207	52,854	(—) 4,207
North Dakota	4,983	43,200	29,440	1,420	76,203	71,220
Ohio	26,436	4,304	.....	3,350	27,390	954
Oklahoma	1,476,457	241,719	28,342	188,898	1,557,620	81,163
Pennsylvania	95,002	37,859	.....	11,137	121,724	26,722
[2]Texas	15,314,964	440,795	170,016	1,009,607	14,916,168	(—)398,796
Utah	29,683	13,000	1,420	1,704	42,399	12,716
West Virginia	38,762	1,100	.....	2,650	37,212	(—) 1,550
Wyoming	973,440	144,997	16,037	69,752	1,064,722	91,282
[3]Miscellaneous	3,123	1,236	.....	530	3,829	706
Total United States	27,468,031	2,252,860	496,428	2,256,765	27,960,554	492,523
[4]**Natural Gas Liquids**						
[5]Alabama	.....	.....	.....	.....	.....	.....
Arkansas	51,050	1,013	91	1,283	50,871	(—) 179
[2]California	329,316	21,229	1,475	29,513	322,507	(—) 6,809
Colorado	11,910	(—) 14	.....	557	11,339	(—) 571
Illinois	24,572	(—) 907	9	3,428	20,246	(—) 4,326
Indiana	149	50	7	37	169	20
Kansas	159,569	14,666	260	6,268	168,227	8,658
Kentucky	10,478	311	156	1,787	9,158	(—) 1,320
[2]Louisiana	684,773	48,322	17,991	37,420	713,666	28,893
Michigan	1,009	(—) 439	94	81	583	(—) 426
Mississippi	52,290	998	2,056	4,413	50,931	(—) 1,359
Montana	3,341	.....	.....	212	3,129	(—) 212
Nebraska	2,586	221	85	176	2,716	130
New Mexico	130,619	29,689	1,347	10,112	151,543	20,924
Ohio	1,710	94	11	37	1,778	68
Oklahoma	311,125	(—) 4,717	4,970	26,472	284,906	(—) 26,219
Pennsylvania	2,563	214	107	244	2,640	77
[2]Texas	2,877,341	350,683	52,437	155,370	3,125,091	247,750
Utah	61	.....	.....	4	57	(—) 4
West Virginia	23,921	658	220	5,271	19,528	(—) 4,393
Wyoming	45,886	12,948	350	2,094	57,090	11,204
[6]Miscellaneous	333	151	2	10	476	143
Total United States	4,724,602	475,170	81,668	284,789	4,996,651	272,049
[7]**Total Liquid Hydrocarbons**						
Alabama	7,860	460	8,400	1,085	15,635	7,775
Arkansas	387,508	42,020	2,431	28,827	403,132	15,624
[2]California	4,090,186	430,438	45,017	388,963	4,176,678	86,492
Colorado	337,088	2,454	8,435	30,947	317,030	(—) 20,058
Illinois	670,907	29,427	3,811	64,438	639,707	(—) 31,200
Indiana	50,816	14,602	2,194	11,908	55,704	4,888
Kansas	951,515	227,912	26,202	120,413	1,085,216	133,701
Kentucky	69,027	7,310	1,962	13,576	64,723	(—) 4,304
[2]Louisiana	2,969,554	454,875	110,634	263,867	3,271,196	301,642
Michigan	65,122	4,843	1,479	13,450	57,994	(—) 7,128
Mississippi	437,677	4,524	6,464	38,925	409,740	(—) 27,937
Montana	111,759	30,272	27,150	9,871	159,310	47,551
Nebraska	18,504	2,300	6,313	2,565	24,552	6,048
New Mexico	742,259	188,352	24,252	69,962	884,901	142,642
[8]New York	57,061	.....	.....	4,207	52,854	(—) 4,207
[8]North Dakota	4,983	43,200	29,440	1,420	76,203	71,220
Ohio	28,146	4,398	11	3,387	29,168	1,022
Oklahoma	1,787,582	237,002	33,312	215,370	1,842,526	54,944
Pennsylvania	97,565	38,073	107	11,381	124,364	26,799
[2]Texas	18,192,305	791,478	222,453	1,164,977	18,041,259	(—)151,046
Utah	29,744	13,000	1,420	1,708	42,456	12,712
West Virginia	62,683	1,758	220	7,921	56,740	(—) 5,943
Wyoming	1,019,326	157,945	16,387	71,846	1,121,812	102,486
[9]Miscellaneous	3,456	1,387	2	540	4,305	849
Total United States	32,192,633	2,728,030	578,096	2,541,554	32,957,205	764,572
WESTERN CANADA						
Crude Oil						
Alberta	1,328,000	57,842	198,914	58,367	1,526,389	198,389
Manitoba	500	.....	1,725	119	2,106	1,606
Saskatchewan	21,000	3,125	101,822	1,700	124,247	103,247
Northwest Territories	27,100	(—) 19	.....	314	26,767	(—) 333
Total Crude Oil	1,376,600	60,948	302,461	60,500	1,679,509	302,909
[10]Natural Gas Liquids	11,348	39,675	14,970	619	65,374	54,026
Total Liquid Hydrocarbons	1,387,948	100,623	317,431	61,119	1,744,883	356,935

[1] Limited area assigned to a discovery until proved larger. [2] Includes off-shore reserves. [3] Fla., Mo., Tenn., Va. [4] Condensate, natural gasoline, LPG. [5] Incl. in Miscl. [6] Ala., Fla., N. Dak. [7] Crude oil and natural gas liquids. [8] Crude oil only. [9] Ala. and N. Dak. natural gas liquids; Mo., Tenn., and Va. crude; Fla. crude and natural gas liquids. [10] All in Alta.

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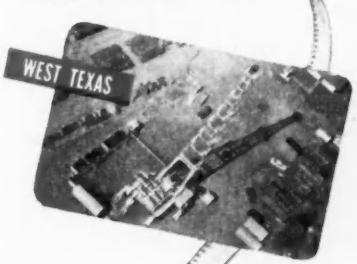

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Estimated Proved Reserves of Crude Oil, Natural Gas Liquids, and Total Liquid Hydrocarbons in the United States, by Years

(Sources: Crude oil by American Petroleum Institute; natural gas liquids and total liquid hydrocarbons by API and American Gas Association. Reserves at end of 1936 and for subsequent years estimated by committees on reserves; earlier data estimated by API department of statistics but not based on geological surveys. Data for latest year estimated by WORLD OIL.)

(THOUSANDS OF BARRELS)

YEAR	Estimated Proved Reserves Beginning of Year	CHANGES IN RESERVES DURING YEAR: (ADDITION) RESERVES PROVED DURING YEAR: Revisions of Previous Estimates	Extensions to Old Pools	Total Revisions and Extensions (Col. 2+3)	New Pools Discovered During Year	Total Reserves Proved During Year (Cols. 4+5)	(Deduction) *Production During Year	(Net Change) Increase or Decrease (Col. 6—Col. 7)	Estimated Proved Reserves at End of Year (Col. 1+Col. 8)	Ratio of Year-End Reserves to Year's Prod. (Year's Supply) (Col. 9÷Col. 7)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crude Oil (Incl. Cycle Plant and Lease Condensate)										
1857-1899	0					†3,439,984	†939,984	†+2,500,000	2,500,000	‡43.8
1900	2,500,000					463,621	63,621	+ 400,000	2,900,000	45.6
1901	2,900,000					169,389	69,389	+ 100,000	3,000,000	43.2
1902	3,000,000					288,767	88,767	+ 200,000	3,200,000	36.0
1903	3,200,000					300,461	100,461	+ 200,000	3,400,000	33.8
1904	3,400,000					317,081	117,081	+ 200,000	3,600,000	30.7
1905	3,600,000					334,717	134,717	+ 200,000	3,800,000	28.2
1906	3,800,000					126,494	126,494		3,800,000	30.0
1907	3,800,000					266,095	166,095	+ 100,000	3,900,000	23.5
1908	3,900,000					278,527	178,527	+ 100,000	4,000,000	22.4
1909	4,000,000					383,171	183,171	+ 200,000	4,200,000	22.9
1910	4,200,000					509,557	209,557	+ 300,000	4,500,000	21.5
1911	4,500,000					720,449	220,449	+ 500,000	5,000,000	22.7
1912	5,000,000					622,935	222,935	+ 400,000	5,400,000	23.8
1913	5,400,000					348,446	284,466	+ 100,000	5,500,000	22.1
1914	5,500,000					165,763	265,763	— 100,000	5,400,000	19.9
1915	5,400,000					381,104	281,104	+ 100,000	5,500,000	19.6
1916	5,500,000					700,767	300,767	+ 400,000	5,900,000	19.6
1917	5,900,000					335,316	335,316		5,900,000	17.6
1918	5,900,000					655,928	355,928	+ 300,000	6,200,000	17.4
1919	6,200,000					878,367	378,367	+ 500,000	6,700,000	17.7
1920	6,700,000					942,929	442,929	+ 500,000	7,200,000	16.3
1921	7,200,000					1,072,183	472,183	+ 600,000	7,800,000	16.5
1922	7,800,000					357,531	557,531	— 200,000	7,600,000	13.6
1923	7,600,000					732,407	732,407		7,600,000	10.4
1924	7,600,000					613,940	713,940	— 100,000	7,500,000	10.5
1925	7,500,000					1,763,743	763,743	+1,000,000	8,500,000	11.1
1926	8,500,000					1,070,874	770,874	+ 300,000	8,800,000	11.4
1927	8,800,000					2,601,129	901,129	+1,700,000	10,500,000	11.7
1928	10,500,000					1,401,474	901,474	+ 500,000	11,000,000	12.2
1929	11,000,000					3,207,323	1,007,323	+2,200,000	13,200,000	13.1
1930	13,200,000					1,298,011	898,011	+ 400,000	13,600,000	15.1
1931	13,600,000					251,081	851,081	— 600,000	13,000,000	15.3
1932	13,000,000					85,159	785,159	— 700,000	12,300,000	15.7
1933	12,300,000					605,656	905,656	— 300,000	12,000,000	13.3
1934	12,000,000					1,085,065	908,065	+ 177,000	12,177,000	13.4
1935	12,177,000					1,219,596	996,596	+ 233,000	12,400,000	12.4
1936	12,400,000					1,763,087	1,099,687	+ 663,400	13,063,400	11.9
1937	13,063,400			2,792,790	928,742	3,721,532	1,277,664	+2,433,868	15,507,268	12.1
1938	15,507,268			2,243,571	810,493	3,054,064	1,213,186	+1,840,878	17,348,146	14.3
1939	17,348,146			2,058,455	340,667	2,399,122	1,264,256	+1,134,866	18,483,012	14.6
1940	18,483,012			1,607,012	286,338	1,893,350	1,351,847	+ 541,503	19,024,515	14.1
1941	19,024,515			1,538,989	429,974	1,968,963	1,404,182	+ 564,781	19,589,296	13.9
1942	19,589,296			1,612,925	260,051	1,878,976	1,385,479	+ 493,497	20,082,793	14.5
1943	20,082,793			1,202,368	282,418	1,484,786	1,503,427	— 18,641	20,064,152	13.3
1944	20,064,152			1,556,192	511,308	2,067,500	1,678,421	+ 389,079	20,453,231	12.2
1945	20,453,231	+ 248,891	1,441,424	1,690,315	419,984	2,110,299	1,736,717	+ 373,582	20,826,813	12.0
Crude Oil Only:										
1945	19,784,530					1,870,971	1,713,655	+ 157,316	19,941,846	11.6
1946	19,941,846	+1,254,705	1,158,923	2,413,628	244,434	2,658,062	1,726,348	+ 931,714	20,873,560	12.1
1947	20,873,560	+ 749,278	1,269,862	2,019,140	445,430	2,464,570	1,850,445	+ 614,125	21,487,685	11.6
1948	21,487,685	+1,958,853	1,439,873	3,398,726	396,481	3,795,207	2,002,448	+1,792,759	23,280,444	11.6
1949	23,280,444	+ 603,566	1,693,862	2,297,428	890,417	3,187,845	1,818,800	+1,369,045	24,649,489	13.6
1950	24,649,489	+ 663,378	1,334,391	1,997,769	564,916	2,562,685	1,943,776	+ 618,909	25,268,398	13.0
1951	25,268,328	+1,776,110	2,248,588	4,024,698	389,256	4,413,954	2,214,321	+2,199,633	27,468,031	12.4
1952	27,468,031	+ 743,729	1,509,131	2,252,860	496,428	2,749,288	2,256,765	+ 492,523	27,960,554	12.4
§1953	27,960,554					3,370,352	⧗2,323,924	+1,046,428	29,006,982	12.5
Natural Gas Liquids (Condensate, Natural Gasoline, Liquefied Petroleum Gases):										
1946									3,163,219	
1947	3,163,219			192,237	59,301	251,538	160,782	+ 90,756	3,253,975	20.2
1948	3,253,975			405,874	64,683	470,557	183,749	+ 286,808	3,540,783	19.3
1949	3,540,783			294,211	92,565	386,776	198,547	+ 188,229	3,729,012	18.8
1950	3,729,012			707,879	58,183	766,062	227,411	+ 538,651	4,267,663	18.8
1951	4,267,663			648,497	75,494	723,991	267,052	+ 456,939	4,724,602	17.7
1952	4,724,602			475,170	81,668	556,838	284,789	+ 272,049	4,996,651	17.5
§1953	4,996,651					682,126	*307,420	+ 374,706	5,371,357	17.5
Total Liquid Hydrocarbons:										
1946									24,036,779	
1947	24,036,779			2,211,377	564,731	2,716,108	2,011,227	+ 704,881	24,741,660	12.3
1948	24,741,660			3,804,600	461,164	4,265,764	2,186,197	+2,079,567	26,821,227	12.3
1949	26,821,227			2,591,639	982,982	3,574,621	2,017,347	+1,557,274	28,378,501	14.1
1950	28,378,501			2,705,648	623,099	3,328,747	2,171,187	+1,157,560	29,536,061	13.6
1951	29,536,061			4,673,195	464,750	5,137,945	2,481,373	+2,656,572	32,192,633	13.0
1952	32,192,633			2,728,030	578,096	3,306,126	2,541,554	+ 764,572	32,957,205	13.0
§1953	32,957,205					4,052,478	2,631,344	+1,421,134	34,378 339	13.1

* Production for 1936 and previous years from U. S. Bureau of Mines; production for 1937 and each subsequent year compiled by API (and AGA) committees on basis of 11 months actual and December estimated. Small variance of these figures from actual production as later reported is compensated by revision when reserves report for succeeding year is compiled.

† During years 1857-1899. ‡ Based on production of 57,071 thousand barrels in 1899. § Estimated by WORLD OIL. ⧗ Crude oil only, not including 33,557 lease condensate fed into pipe lines with crude oil. * Includes 242,363 plant production of natural gasoline, etc; 33,557 lease condensate; estimated 31,500 losses and waste.

Interchangeable

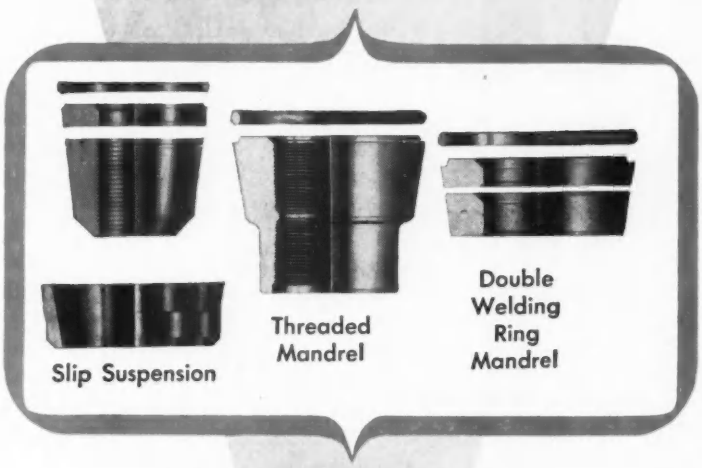
SLIP OR MANDREL SUSPENSION

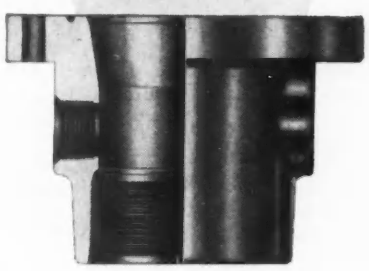
WITH

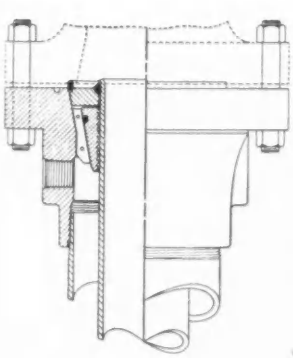
RECTORHEAD

TYPE "MS"

CASING HEAD







Assembly of Type MS Rectorhead Casing Head utilizing slips and slip bowl. Available only in three sizes: 10¾", 9⅝", and 8⅝", and in Series 600 and 900 only. Head is furnished complete with slips, slip bowl, single welding ring, bolts, nuts and API Ring Gasket. Heads are available with threaded or flanged side outlets.

This Rector Type MS Casing Head offers you slip suspension or the choice of two types of mandrel suspension . . . all of which utilize the famous Rector metal-to-metal seal.

In the 8⅝" size, especially designed slips fit directly into the head body. In the 9⅝" and 10¾" sizes, the slips ride in a special slip bowl. The metal-to-metal, leakproof seal is obtained by use of a single welding ring placed directly above the slips and welded to the casing. An API Ring Gasket at the juncture of the welding ring and head body completes the seal.

For mandrel suspension you have the choice of a threaded or double welded type. With either hanger an API Ring Gasket acts dually as the sealing medium and hold-down. These mandrel hangers are installed the same as in the Type M Rectorhead Casing Head which has a restricted ring groove to permit installation of a higher working pressure head without use of additional flanges. The Type MS Casing Head is similar in design but lighter in construction than our Type RH and is comparable in price and setting depth to our Type M Mandrel Hanger Casing Head.

Ask your nearest Rector Representative or authorized Supply Store about the Type MS Rectorhead Casing Head for your next well.

SEE OUR CATALOG IN THE COMPOSITE CATALOG

PESA

RECTOR WELL EQUIPMENT COMPANY INC

★ MAKING THE OIL INDUSTRY SAFER ★

1100 NORTH COMMERCE ST FORT WORTH, TEXAS

Houston Plant: 2215 Commerce St.

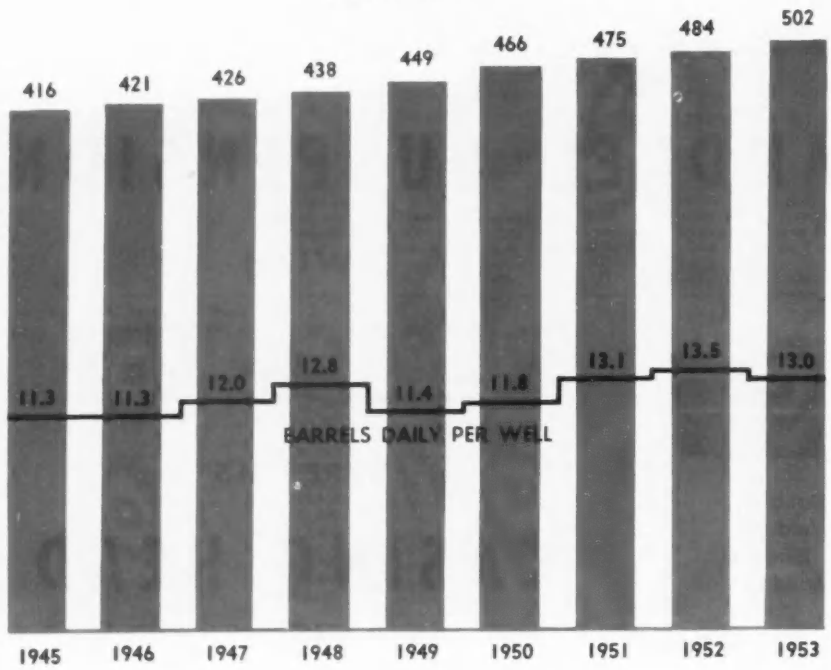
REPRESENTATIVES IN ALL ACTIVE FIELDS

ASSOCIATION OF WELL HEAD EQUIPMENT MANUFACTURERS CERTIFIED

RECTORHEAD RECTOR FULBORE CEMENTING METHOD RECTORSEAL

PRODUCING OIL WELLS AND AVERAGE OUTPUT

(IN THOUSANDS)



Producing Oil Wells . . . exceed a half million for first time after substantial increase in 1953.

THE NUMBER of producing oil wells in the U. S. now exceeds a half million, for the first time, following a substantial increase in 1953.

Wells producing crude oil at end of 1953 totaled 501,859, an increase of 12,037 wells or 2.5 percent over the 489,822 yielding crude at end of 1952. This net increase was achieved with benefit of completion of 25,323 new oil wells, greatest number ever drilled, exceeding the previous 33-year record of 24,278 oil well completions in 1920. (At that time there was an oil shortage, and crude was selling for over $3 per barrel, highest price on record since the early 1870's.

The net gain of 12,037 producing oil wells in 1953 while 25,323 were being completed indicated that during the year 13,286 producing oil wells were abandoned or shut in.

Production of U. S. oil wells averaged 13.0 barrels per day per well in 1953, about the same as in 1952 and 1951. This output is very low in comparison with daily production for many wells in other countries. But it is much better than in the U. S. in prior years, the output having increased steadily from around 5 barrels daily per well in the early 1920s. The increase reflects conservation efforts and prolongation of the flowing and producing life of wells. Of the 501,859 producing oil wells at end of 1953, 59,465 or 11.8 percent were flowing, compared with 57,447 out of 489,822 or 11.7 percent at end of 1952.

In addition to crude wells, there were 4327 wells in the U. S. at end of 1953, producing an average of 21.8 barrels per well per day of lease condensate going into pipe lines along with crude. That compared with 3436 wells averaging 24.8 barrels daily at end of 1952.

Combined crude and condensate wells at end of 1953 totaled 506,186 and averaged 12.3 barrels production per well per day, compared with 493,258 wells averaging 13.4 barrels daily at end of 1952.

(SEE TABLE, PAGE 174)

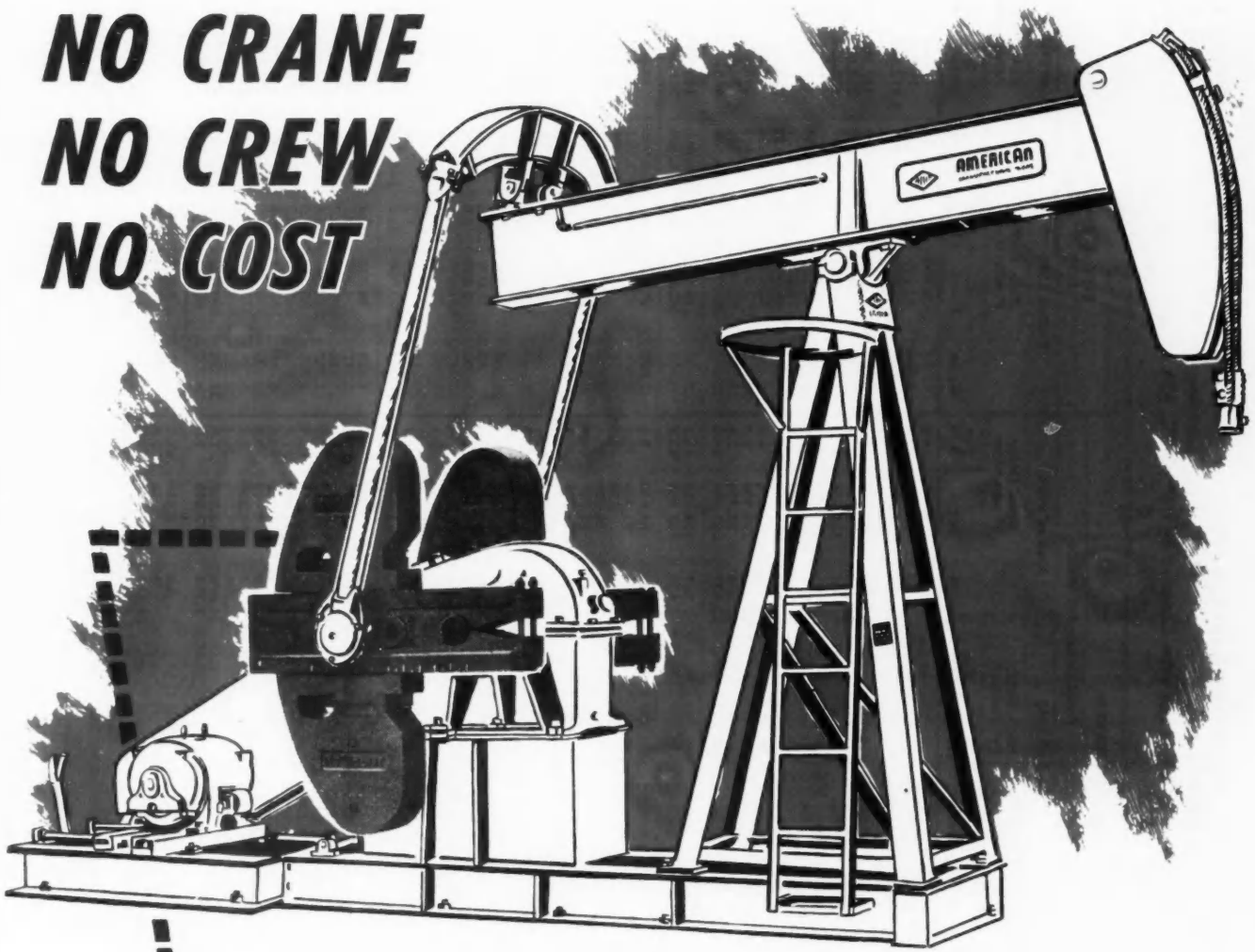
U. S. Producing Oil Wells and Daily Output Per Well

Sources: Producing wells and output from Bureau of Mines except as noted. Wells completed from WORLD OIL and predecessor, The Oil Weekly, except 1918-1920 from Bureau of Mines. Output per well obtained by dividing daily average U. S. production for year by average number between wells producing Jan. 1 and Dec. 31.

YEAR	Number of Producing Oil Wells At End of Year	Gain In No. Producing Oil Wells	New Oil Wells Completed in Year	Production Per Well Per Day During Year
1918	263,375	.....	17,860	....
1919	227,000	23,625	21,041	4.8
1920	251,000	24,000	24,278	5.0
1921	274,500	23,500	14,715	4.9
1922	284,880	10,380	17,790	5.7
1923	290,100	5,220	16,182	6.6
1924	299,100	9,000	14,707	6.2
1925	306,100	7,000	17,029	6.5
1926	318,600	12,500	18,626	6.8
1927	323,300	4,700	14,382	7.7
1928	327,800	4,500	12,348	7.6
1929	328,200	400	15,362	8.4
1930	331,070	2,870	11,693	7.5
1931	315,850	—15,220	7,011	7.2
1932	321,500	5,650	10,530	6.7
1933	326,850	5,350	8,070	7.7
1934	333,070	6,220	13,119	7.5
1935	340,990	7,920	15,418	8.1
1936	349,450	8,460	18,704	8.7
1937	363,030	13,580	23,115	9.8
1938	369,640	6,610	19,106	9.1
1939	380,390	10,750	17,734	9.2
1940	389,010	8,620	19,843	9.6
1941	399,960	10,950	19,590	9.7
1942	404,840	4,880	10,977	9.4
1943	407,170	2,330	9,887	10.2
1944	412,220	5,050	13,502	11.2
1945	415,750	3,530	13,944	11.3
1946	421,460	5,710	16,087	11.3
1947	426,280	4,820	17,613	12.0
1948	437,880	11,600	22,197	12.8
1949	448,680	10,800	21,415	11.4
1950	465,870	17,190	23,775	11.8
1951	474,990	9,120	23,532	13.1
1952	488,520	13,530	23,371	13.0
*1952	489,822	13,485	23,371	12.8
*1953	501,859	12,037	25,323	13.0

*WORLD OIL estimate; details by states in separate table.

NO CRANE
NO CREW
NO COST



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This new American Pumping Unit saves you operating time and money because it is a fast, easy one man job to adjust the unit counterbalance. Simply loosen two bolts that hold each master weight in position and turn the acme screw that moves the weight to the desired position. Yes, that's all there is to adjusting the unit counterbalance on the new American Pumping Units. Specify American and cut *Your* operating cost. Send today for free catalog or contact your nearest supply store or American Office.

AMERICAN MFG. CO. OF TEXAS

FORT WORTH 11, TEXAS

Houston • Kilgore • Odessa • Tulsa

Casper, Wyoming • Calgary, Alberta, Canada

Active Producing Crude Oil and Condensate Wells in U. S., Methods of Producing, and Average Output Per Well, by States and Districts, at End of 1952 and 1953

Data represents only active crude oil and condensate producing wells, including no inactive or shut-in wells and no gas wells. Compiled by WORLD OIL, with cooperation of state conservation departments and other sources.

STATE or DISTRICT	CONDENSATE WELLS						CRUDE OIL WELLS										TOTAL CRUDE OIL AND CONDENSATE WELLS					
	End of 1952			End of 1953			Flowing		Artificial Lift		Total Crude Oil Wells						End of 1952			End of 1953		
		Bbls. Daily Production			Bbls. Daily Production						End of 1952			End of 1953			Bbls. Daily Production			Bbls. Daily Production		
	Wells	Total	Per Well	Wells	Total	Per Well	End of 1952	End of 1953	End of 1952	End of 1953	Wells	Total	Per Well	Wells	Total	Per Well	Wells	Total	Per Well	Wells	Total	Per Well
Alabama							4	2	92	110	96	4,200	43.8	112	4,400	39.3	96	4,200	43.8	112	4,400	39.3
Arkansas	68	650	9.6	78	650	8.3	350	336	3,578	3,699	3,928	81,550	20.8	4,035	77,100	19.1	3,996	82,200	20.6	4,113	77,750	18.9
California							1,866	1,834	29,005	29,950	30,871	991,550	32.1	31,784	1,012,150	31.8	30,871	991,550	32.1	31,784	1,012,150	31.8
San Joaquin Valley							1,070	1,040	15,176	15,285	16,246	414,800	25.5	16,325	417,300	25.6	16,246	414,800	25.5	16,325	417,300	25.6
Coastal District							598	640	3,997	4,422	4,595	239,950	52.2	5,062	264,600	52.3	4,595	239,950	52.2	5,062	264,600	52.3
Los Angeles Basin							198	154	9,832	10,243	10,030	336,800	33.6	10,397	330,250	31.8	10,030	336,800	33.6	10,397	330,250	31.8
Colorado							85	132	886	1,098	971	84,700	87.2	1,230	108,450	88.2	971	84,700	87.2	1,230	108,450	88.2
Florida							1		11	12	12	1,450	120.8	12	1,500	125.0	12	1,450	120.8	12	1,500	125.0 †
Illinois							7	5	33,727	34,417	33,734	166,900	4.9	34,422	169,700	4.9	33,734	166,900	4.9	34,422	169,700	4.9
Indiana							22	9	4,473	4,825	4,495	34,800	7.7	4,834	33,050	6.8	4,495	34,800	7.7	4,834	33,050	6.8
Kansas							58	42	32,018	33,272	32,076	337,900	10.5	33,314	298,950	9.0	32,076	337,900	10.5	33,314	298,950	9.0
Kentucky									15,806	16,234	15,806	31,100	2.0	16,234	32,350	2.0	15,806	31,100	2.0	16,234	32,350	2.0 †
Louisiana	1,244	34,350	27.6	1,632	41,000	25.1	3,591	4,354	8,770	8,583	12,361	666,850	53.9	12,937	627,400	48.5	13,605	701,200	51.5	14,569	668,400	45.9 †
North Louisiana	461	2,500	5.4	754	3,500	4.6	424	811	6,867	6,496	7,291	116,100	15.9	7,307	104,650	14.3	7,752	118,600	15.3	8,061	108,150	13.4
South Louisiana	783	31,850	40.7	878	37,500	42.7	3,167	3,543	1,903	2,087	5,070	550,750	108.6	5,630	522,750	92.8	5,853	582,600	99.5	6,508	560,250	86.1
Michigan							134	123	3,858	3,863	3,992	36,300	9.1	3,986	33,600	8.4	3,992	36,300	9.1	3,986	33,600	8.4
Mississippi	128	4,050	31.6	135	3,300	24.4	206	307	1,504	1,536	1,710	95,900	56.1	1,843	91,950	49.9	1,838	99,950	54.4	1,978	95,250	48.1
Missouri									70	91	70	50	0.7	91	50	0.5	70	50	0.7	91	50	0.5
Montana	8						30	51	3,286	3,421	3,316	31,050	9.4	3,472	36,800	10.6	3,324	31,050	9.3	3,472	36,800	10.6
Nebraska							2		221	302	223	12,500	56.1	302	14,750	48.8	223	12,500	56.1	302	14,750	48.8
New Mexico	17	400	23.5	42	850	20.2	3,462	3,644	3,141	3,606	6,603	177,800	26.9	7,250	191,200	26.4	6,620	178,200	26.9	7,292	192,050	26.3
Northwest New Mexico									70	65	70	2,100	30.0	65	1,450	22.3	70	2,100	30.0	65	1,450	22.3
Southeast New Mexico	17	400	23.5	42	850	20.2	3,462	3,644	3,071	3,541	6,533	175,700	26.9	7,185	189,750	26.4	6,550	176,100	26.9	7,227	190,600	26.4
New York									23,000	23,000	23,000	11,550	0.5	23,000	11,500	0.5	23,000	11,550	0.5	23,000	11,500	0.5
North Dakota							68	179	17	73	85	11,000	130.6	252	13,050	51.8	85	11,000	130.6	252	13,050	51.8
Ohio							40	70	19,410	19,400	19,450	9,300	0.5	19,470	10,550	0.5	19,450	9,300	0.5	19,470	10,550	0.5
Oklahoma							1,485	2,120	58,762	60,956	60,247	554,450	9.2	63,076	530,600	8.4	60,247	554,450	9.2	63,076	530,600	8.4
Pennsylvania									81,200	80,500	81,200	30,100	0.4	80,500	25,550	0.3	81,200	30,100	0.4	80,500	25,550	0.3
South Dakota										1				1	†					1	†	
Tennessee									35	29	35	50	1.4	29	50	1.7	35	50	1.4	29	50	1.7
*Texas	1,947	44,950	23.1	2,424	47,500	19.6	45,784	45,976	90,615	94,884	136,399	2,958,100	21.7	140,860	2,561,700	18.2	138,346	3,003,050	21.7	143,284	2,609,200	18.2
Dist. 1: South Central	19	200	10.5	32	400	12.5	339	340	3,776	4,110	4,115	38,600	9.4	4,450	38,600	8.7	4,134	38,800	9.4	4,482	39,000	8.7
Dist. 2: Middle Gulf	379	4,550	12.0	540	5,950	11.0	3,277	3,246	1,516	1,674	4,793	169,750	35.4	4,920	135,050	27.4	5,172	174,300	33.7	5,460	141,000	25.8
Dist. 3: Upper Gulf	661	24,950	37.7	771	24,200	31.4	5,107	5,080	5,877	6,080	10,984	484,500	44.1	11,160	412,750	37.0	11,645	509,450	43.7	11,931	436,950	36.6
Dist. 4: L. Gulf-S.W.	273	5,250	19.2	348	5,700	16.4	5,084	5,375	6,200	6,185	11,284	267,750	23.7	11,560	239,650	20.7	11,557	273,000	23.6	11,908	245,350	20.6
Dist. 5: East Central	54	200	3.7	71	450	6.3	524	465	1,715	1,885	2,239	54,850	24.5	2,350	44,400	18.9	2,293	55,050	24.0	2,421	44,850	18.5
Dist. 6: E. Texas Field							11,535	11,180	9,364	9,310	20,899	265,000	12.7	20,490	231,450	11.3	20,899	265,000	12.7	20,490	231,450	11.3
Dist. 6: Northeast	351	4,000	11.4	407	4,600	11.3	1,136	1,140	2,298	2,360	3,434	133,600	38.9	3,500	114,100	32.6	3,785	137,600	36.4	3,907	118,700	30.4
Dist. 7-B: N. Central	48	50	1.0	47	50	1.1	1,818	2,150	8,554	8,950	10,372	117,950	11.4	11,100	120,400	10.8	10,420	118,000	11.3	11,147	120,450	10.8
Dist. 7-C: W. Central	72	5,300	73.6	76	4,400	57.9	2,127	2,560	2,535	2,960	4,662	170,200	36.5	5,520	155,850	28.2	4,734	175,500	37.1	5,596	160,250	28.6
Dist. 8: West	35	200	5.7	60	1,500	25.0	13,265	12,850	19,082	20,350	32,347	988,950	30.6	33,200	809,150	24.4	32,382	989,150	30.5	33,260	810,650	24.4
Dist. 9: North	51	200	3.9	65	200	3.1	1,537	1,500	21,736	22,900	23,273	189,800	8.2	24,400	182,800	7.5	23,324	190,000	8.1	24,465	183,000	7.5
Dist. 10: Panhandle	4	50	12.5	7	50	7.1	35	90	7,962	8,120	7,997	80,650	10.1	8,210	77,500	9.4	8,001	80,700	10.1	8,217	77,550	9.4
Utah							10	3	51	66	61	5,200	85.2	69	4,550	65.9	61	5,200	85.2	69	4,550	65.9
Virginia									25	25	25	50	2.0	25	50	2.0	25	50	2.0	25	50	2.0
West Virginia									14,200	13,600	14,200	7,250	0.5	13,600	9,150	0.7	14,200	7,250	0.5	13,600	9,150	0.7
Wyoming	24	950	39.6	16	1,050	65.6	242	278	4,614	4,841	4,856	206,700	42.6	5,119	229,900	44.9	4,880	207,650	42.5	5,135	230,950	45.0
Total United States	3,436	85,350	24.8	4,327	94,350	21.8	57,447	59,465	432,375	442,394	489,822	6,548,350	13.4	501,859	6,130,050	12.2	493,258	6,633,700	13.4	506,186	6,224,400	12.3

* Texas production by districts from A.P.I. and different slightly from state total, which is from Bureau of Mines.

† Shell Oil Co.'s State "A" 1, sw se 9-21n-4e, Harding County, northwest corner of South Dakota at end of year in process of completing for an initial pump gauge of some 150 barrels oil (20 gravity) per day from the Red River (Ordovician) at 8587-8600 feet. First commercial oil producer for South Dakota.

Refinery Operations . . .

concern over surplus product stocks rising.

A RISING CONCERN over surplus product stocks and an accompanying alertness to the problem of products quality was the refining industry's legacy from 1953, a year which prolonged the trend of booming capacity and hastening runs to stills.

Daily capacity had leaped ahead at year's end to 8,078,000 barrels as compared with 7,585,000 for the like period a year earlier. Runs to stills matched this brisk tempo by moving up from 6,670,000 to 7,004,000 barrels daily—and the top of the curve was not yet in sight. Crude runs for 1954 are expected to rise to 7,156,000, a 2.2. percent increase.

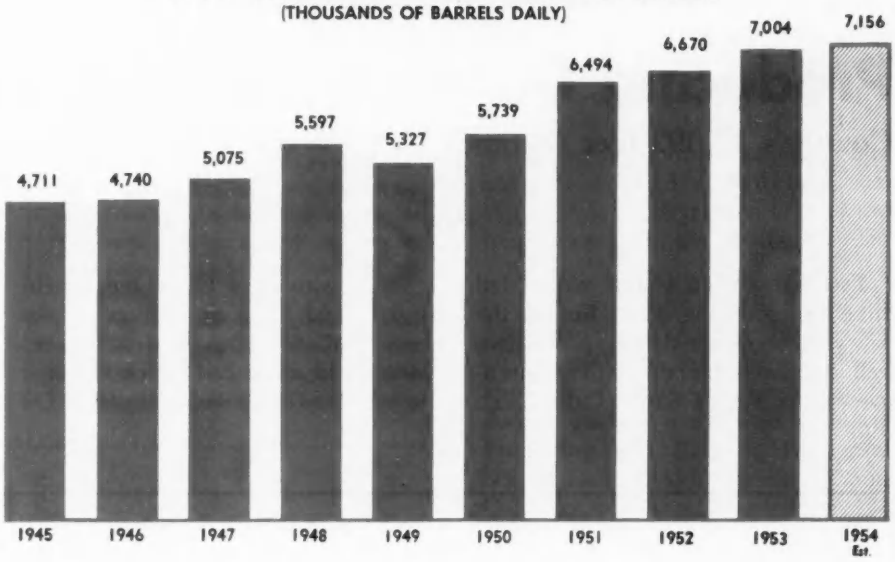
This means the U. S. will have enough capacity to meet maximum anticipated demands, with more than sufficient in excess to prolong the problem of excessive stocks in many categories. The results will be intensified competition regarding the quality of products; greater attention to product balance, particularly as concerns gasoline, mid-barrel and fuel oil; and more effort in planning, engineering and construction to improve efficiency.

The Texas Gulf Coast repeated as the area with the largest crude runs to stills last year with 621,073,000 barrels. This resulted from a daily average run of 1,702,000 barrels, or 6.4 percent more than the year before.

Biggest gainer percentagewise was the Appalachian District No. 2 with 15.6 percent, the result of an increase from 28,148,000 in 1952 to 32,643,000 in the year just ended. Gain for the Appalachian area as a whole was 8.2 percent, which was just below the 8.3 increase registered by the Oklahoma-Kansas-Missouri area. The latter stepped up runs from 199,141,000 to 215,024,000 during the past year.

U. S. ANNUAL CRUDE RUNS TO STILLS

(THOUSANDS OF BARRELS DAILY)



U. S. Crude Runs to Stills and Refining Capacity, by Districts, 1952 and 1953

Runs from Bureau of Mines except Nov.-Dec., 1953, from API. Capacities from API.

(THOUSANDS OF BARRELS)

	Capacity and Use in Dec.				Crude Run During Year				
	Capacity		Percent Operated		Total Amount		Daily Average		
Refining District	1952	1953	1952	1953	1952	1953	1952	1953	% Diff. '52-'53
East Coast	1,103	1,151	95.9	88.0	376,769	381,174	1,029	1,044	+ 1.5
Appalachian	212	226	95.3	88.9	66,880	72,353	183	198	+ 8.2
Dist. 1	124	132	87.1	90.9	38,732	39,710	106	109	+ 2.8
Dist. 2	88	94	106.8	86.2	28,148	32,643	77	89	+15.6
Ill.-Ind.-Ky.	1,399	1,485	92.1	89.5	449,171	466,729	1,227	1,279	+ 4.2
Okla.-Kans.-Mo.	651	694	86.9	82.6	199,141	215,024	544	589	+ 8.3
Texas Inland	297	318	85.9	72.6	93,888	93,090	257	255	— .8
Texas Gulf	1,787	1,919	96.1	87.6	585,258	621,073	1,599	1,702	+ 6.4
La. Gulf	526	624	105.1	88.5	191,072	201,083	522	551	+ 5.6
N. La.-Ark.	93	101	91.4	74.3	29,122	30,976	80	85	+ 6.3
Rocky Mts.	283	297	89.8	90.6	88,030	92,764	240	254	+ 5.8
Dist. 3	22	23	86.4	87.0	6,617	7,041	18	19	+ 5.6
Dist. 4	261	274	90.0	90.9	81,413	85,723	222	235	+ 5.9
California	1,234	1,264	78.8	84.4	361,928	382,208	989	1,047	+ 5.9
Total U.S.	7,585	8,079	91.7	86.5	2,441,259	2,556,474	6,670	7,004	+ 5.0

U. S. Crude Runs to Stills, by Years

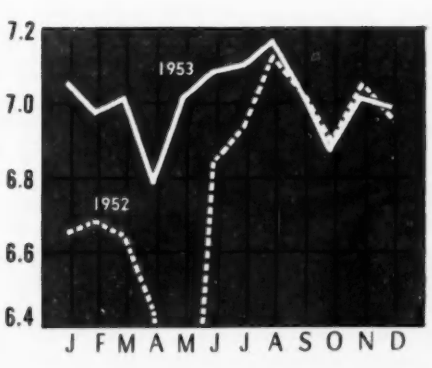
Source: Bureau of Mines, except Nov.-Dec., 1953, from API.

(THOUSANDS OF BARRELS)

Year	Total	Daily	Year	Total	Daily
			1936	1,068,570	2,919
			1937	1,183,440	3,242
1918	326,025	893	1938	1,165,015	3,192
1919	361,520	990	1939	1,237,840	3,391
1920	433,915	1,186	1940	1,294,283	3,536
1921	443,363	1,215	1941	1,409,192	3,861
1922	500,706	1,372	1942	1,334,103	4,655
1923	581,238	1,592	1943	1,429,738	3,917
1924	643,719	1,759	1944	1,665,684	4,551
1925	739,920	2,027	1945	1,719,534	4,711
1926	779,264	2,135	1946	1,730,197	4,740
1927	828,835	2,271	1947	1,852,246	5,075
1928	913,295	2,295	1948	2,048,349	5,597
1929	987,708	2,706	1949	5,944,221	5,327
1930	927,447	2,541	1950	2,094,867	5,739
1931	894,608	2,451	1951	2,370,404	6,494
1932	819,997	2,240	1952	2,441,259	6,670
1933	861,254	2,360	1953	2,556,474	7,004
1934	895,636	2,454	1954		
1935	965,790	2,646	Est.	2,611,940	7,156

U. S. CRUDE RUNS TO STILLS

(Millions of Barrels Daily)

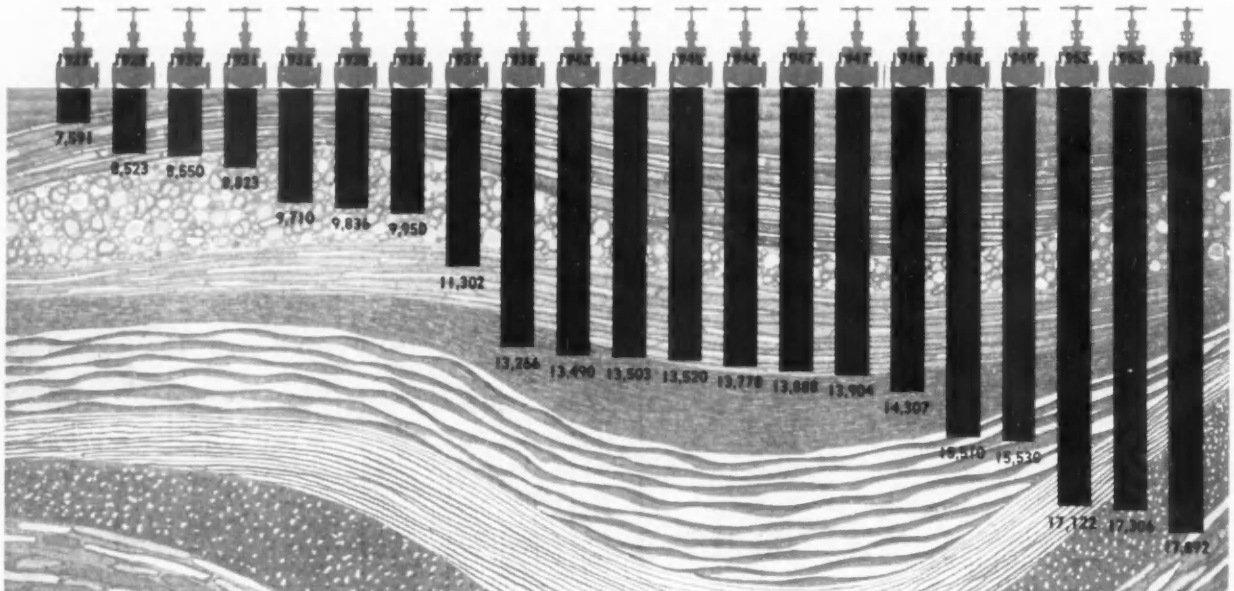


Producing Depth Records . . . broken three times. Kern County's 17,892 feet becomes U. S.' deepest.

THE PRODUCING DEPTH record fell three times during 1953, but as the new year began the deepest productive well remained for the fifth consecutive year in Kern County, California.

The new mark of 17,892 feet is held by Richfield Oil Corporation's Coles Levee "A" 67-29, a Coles Levee, North, field oil well. Deepest through the end of 1952 was Standard Oil Company of California's Mushrush 5, Wasco field, Kern County, completed in 1949 at 15,530 feet.

The other two wells which exceeded the old record during 1953



Holders of Record as Deepest Producing Well in U. S., Since 1927

Year Drilled	WELL AND LOCATION	Production	Bottom of Pay (Feet)
1927	E. J. Miley's Athens 6, Rosecrans field, California		7,591
1928	Texon Oil & Land Co.'s University 1-B, Big Lake field, West Texas	Oil	8,523
1930	Star Petroleum Co.'s Colby 2, Long Beach, California		8,550
1931	Tide Water Associated Oil Co.'s Lloyd 57, Ventura Avenue field, California	Oil	8,823
1932	Tide Water Associated Oil Co.'s Lloyd 83, Ventura Avenue field, California	Oil	9,710
1935	Tide Water Associated Oil Co.'s Lloyd 131, Ventura Avenue field, California	Oil	9,836
1936	The Texas Co.'s Lafitte 5, Lafitte field, South Louisiana		9,950
1937	Union Oil Co.'s Kerneo 85-34, Rio Bravo field, Kern County, California	Oil	11,302
1938	Fohs Oil Co.'s Buckley-Bourg 1, DeLarge field, South Louisiana	*Cond.	13,266
1943	Union Producing Co.-Fohs Oil Co.'s Fitzpatriek-Vizard 1, DeLarge field, South Louisiana	*Cond.	13,490
1944	Union Producing Co.-Fohs Oil Co.'s Buckley-Bourg 2, DeLarge field, South Louisiana	Oil	13,503
1945	Shell Oil Co.'s Smith-State Unit 1-1, Weeks Island field, South Louisiana	Oil	13,520
1946	Shell Oil Co.'s Smith-State Unit 1-2, Weeks Island field, South Louisiana	Oil	13,778
1947	Shell Oil Co.'s Smith-State Unit 1-3, Weeks Island field, South Louisiana	Oil	13,888
1947	The Texas Co.'s LaFourche Basin Levee Dist. 1, Queen Bess Island field, South Louisiana	*Cond.	13,904
1948	Pure Oil Co.'s Unit 1, West Poison Spider field, Wyoming	Oil	14,307
1948	Denver Producing & Refg. Co.'s School Land 1-A, Cogar field, Caddo County, Oklahoma	Gas	15,510
1949	Standard Oil Co. of California's Mushrush 5, Wasco field, Kern County, California	Oil	15,530
1953	Shell Oil Co.'s Weeks-Gall Unit 1-1, Weeks Island field, South Louisiana	Oil	17,122
1953	Shell Oil Co.'s Gonsoulin Minvielle-State Unit 2, Weeks Island field, South Louisiana	Oil	17,306
1953	Richfield Oil Corp.'s Coles Levee "A" 67-29, Coles Levee, North field, California	Oil	17,892

*Gas and Condensate Production.

were drilled by Shell Oil Company in the Weeks Island field of South Louisiana. Shell's Gonsoulin Minvielle-State Unit 2 was finaled at 17,306 feet, and Shell's Weeks-Gall Unit 1-1 was completed at 17,122 feet.

The 2362-foot margin by which the 1953 record exceeded that of 1952 was the greatest in modern years. Nearest approach to it was the 1964-foot improvement by which Fohs Oil Company's Buckley-Bourg 1, a South Louisiana well, exceeded the 1937 record.

The recent year furthered the trend to deeper drilling, but offered an odd contrast to the widespread record-breaking of recent years. Whereas an even dozen area records went by the board in 1951 and ten yielded to the bit in 1952, only those in California and South Louisiana were tumbled in 1953.

The 1953 mark was the eighth since 1926 set by a California well and placed that state in a tie with the South Louisiana region for the honor of having the most record depth producers in modern history. Only other areas to have record depth producers since 1926 are West Texas, Wyoming and Oklahoma.

Humble Oil & Refining Company and Phillips Petroleum Company lead in number of record-depth area producers. Humble's wells hold the producing depth record in three areas, and Phillips has brought in two record-setters and shared another with The Carter Oil Company.

Illustrative of the tremendous strides in deepening production in recent years is the fact that of the 37 producing areas in the U. S., 32 have had new record production since World War II. Seventeen area records have been set in the 1950's.

Of the 37 record-holders, 26 were brought in as oil wells, 10 as gas and 1 as condensate. Among the 10 deepest producers, 8 came in as oil wells and two as gasers. The record for the deepest gas well is still held by Denver Producing and Refining Company's School Land 1-A, Cogar field, Caddo County, Oklahoma, completed in 1948 at 15,510 feet.

Oldest area record is held by United Carbon Company's Howe 1, which got production at 5170 feet in Pike County, Kentucky, in 1932. Shallowest area record holder is Cities Service Oil Company's Jim Cook 1, which found pay at 1444 feet in Atchison County, Missouri, in 1940.

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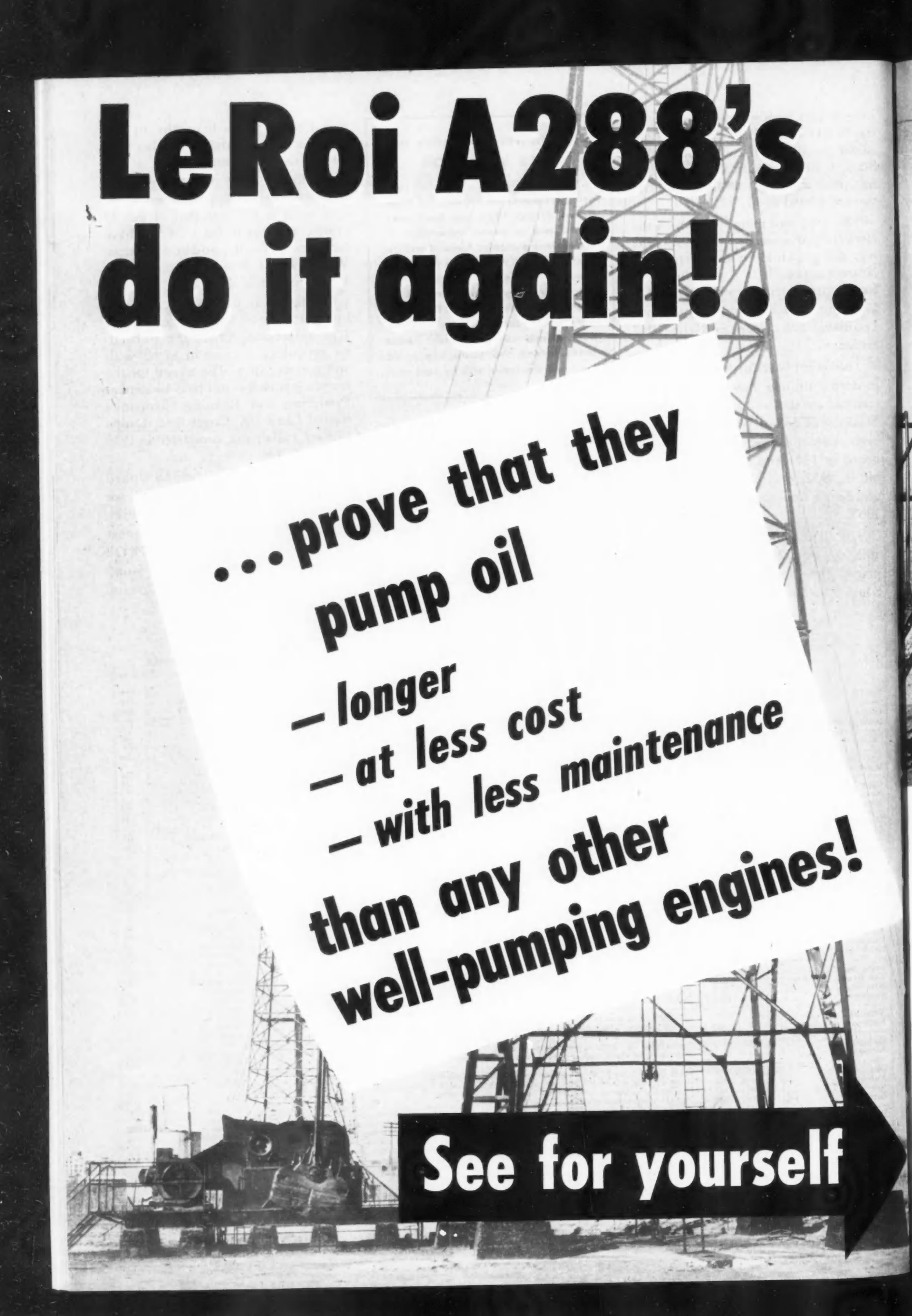
Producing Depth Records in U. S., by States and Districts, and by 1,000-Foot Depth Intervals

STATE or DISTRICT	Bottom of Pay (Feet)	Year Drilled	WELL and LOCATION	Producing Formation	Production
California	17,892	1953	Richfield Oil Corp.'s Coles Levee "A" 67-29, Coles Levee, North, field, Kern County World's deepest prod. well	Eocene	Oil
South Louisiana	17,306	1953	Shell Oil Co.'s Gonsoulin Minvielle-State Unit 2, in 41-14s-7e, Weeks Island field		Oil
Oklahoma	15,510	1948	Denver Producing & Refining Co.'s School Land 1-A, Cogar field, Caddo County	Viola	Gas
West Texas	14,522	1952	Phillips Petroleum Company's Glenna 1, Section 28, Block 101, TCRR Survey, Pecos County	Ellenburger	Oil
Wyoming	14,307	1948	Pure Oil Company's Unit 1, West Poison Spider field, Natrona County	2nd Frontier	Oil
Upper Texas Coast	13,950	1952	Phillips Petroleum Company's Schenck 2-A, Chocolate Bayou field, Brazoria County	Frio	Oil
New Mexico, Southeast	13,573	1952	Buffalo Oil Company's M. E. Baish-Federal 12-B, Section 2-17s-32e, Maljamar field, Lea County	Devonian	Oil
Mississippi	13,082	1947	Gulf Refining Company's L. L. Majors 1, West Ovett field, Jones County	Glen Rose	Oil
Florida	11,588	1948	Humble Oil & Refining Company's Lee Tidewater Cypress Lumber Co. 1-B, Suniland field, Collier County	L. Cretaceous	Oil
Southwest Texas	11,490	1951	Western Natural Gas Company's St. Charles Ranch Co. 14, Blackjack field, Aransas County	Frio	Gas
North Louisiana	10,864	1949	Midstates Oil Corp.'s Lewis-Hearn-Williamson 1, Section 28-23n-8w, TD 11,643; production horizons 10,812-832 and 10,846-864 feet	Smackover "B" Zone	Oil
East Texas	10,312	1942	Humble Oil & Refining Company's Curtis 1, Larissa field, Cherokee County	Pettit	Oil
Utah	10,244	1952	Phillips & Carter's Peterson Unit E-11, Roosevelt field, Uintah County	Wasatch	Oil
North Texas	10,160	1952	Frank Weiner's R. W. Haslip 1, Big Mineral Creek field, Grayson County		*Cond
Lower Texas Coast	10,132	1946	Continental Oil Company's Clay-West Burns 2, Clay West field, Live Oak County	Wilcox	Oil
Montana	9,948	1952	The Texas Company's NPRR (NCT 4) G-1, in 23-17n-53e, Dawson County	Ordovician	Oil
North Dakota	9,570	1952	Amerada Petroleum Corporation's B. H. Risser 1, in 12-149n-96w, McKenzie County	Madison	Oil
Arkansas	9,453	1952	Carter Oil Company's McKamie-Patton Unit C-216-1, McKamie-Patton field, Lafayette County	Smackover	Oil
Colorado	9,435	1950	Delhi Oil Corporation's Barker 5, Barker Dome field, La Plata County	Paradox (L. Penn.)	Gas
South Central Texas	9,018	1946	Quintana Petroleum Corporation's C. Muil 3, Muil field, Atascosa County	Edwards	Oil
Texas Panhandle	8,970	1949	Sinclair Oil & Gas Company's C. S. Lips 1, in 135-C-G & M Survey, Roberts County, Lips field	Mississippian	Oil
New Mexico, Northwest	8,875	1945	Southern Union Gas Company's Barker-Ute Indian 11, Barker Creek field, San Juan County	Paradox	Gas
West Virginia	8,410	1946	Ohio Oil Company's Kuykendall et al 1, Dry Fork District, Tucker County	Oriskany	Gas
Pennsylvania	8,229	1949	Peoples Natural Gas Company's William Piper 1, Unity Township, Westmoreland County	Onondaga	Gas
Nebraska	7,354	1951	Gulf Oil's Sisson 1, in 18-12n-50w, Sisson field, Kimball County	Dakota "J"	Oil
North Central Texas	7,132	1950	Sun Oil Company's Maddox, J. P. 1, Mary Neal field, Nolan County	Ellenburger	Oil
Michigan	6,638	1952	Brazos Oil & Gas Company's State-Chester HE-1, C NE NE 15-29n-2w, Chester Township, Otsego County	Basal Salina	Oil
Kansas	6,536	1951	Stanolind Oil & Gas Company's Daisy Wall 1, Ashland field, Clark County	Viola	Oil
Ohio	5,880	1946	Frank Lyons' Anita B. Wright 1, Hanover Township, Columbiana County	Clinton	Gas
Alabama	5,425	1951	Humble's Charles O. Oswell 1, in 15-3n-2e, Carlton, South field, Baldwin County		Oil
New York	5,229	1942	E. Kent Kane's Robert Lewis 1, West Union Township, Steuben County	Oriskany	Gas
Kentucky	5,170	1932	United Carbon Company's Howe 1, Pike County	Devonian	Gas
Illinois	4,780	1943	Kingwood Oil Company's Shanafelt 24-A, Salem field, Marion County	Trenton	Oil
Maryland	4,456	1949	Cumberland & Allegheny Gas Company's Elmer N. Beachy S-424, Garrett County	Huntersville	Gas
Indiana	3,011	1946	H. E. Ledbetter's Noble Utley 1, Springfield Consolidated field, Posey County	McClosky	Oil
Tennessee	1,790	1948	Turner Bros. and Shaner's Fred Johnson 1, Forbus field, Fentress County	Knox	Oil
Missouri	1,444	1940	Cities Service Oil Company's Jim Cook 1, Tarkio field, Atchison County	Bartlesville	Oil

* Gas and Condensate production.

LeRoi A288's do it again!....

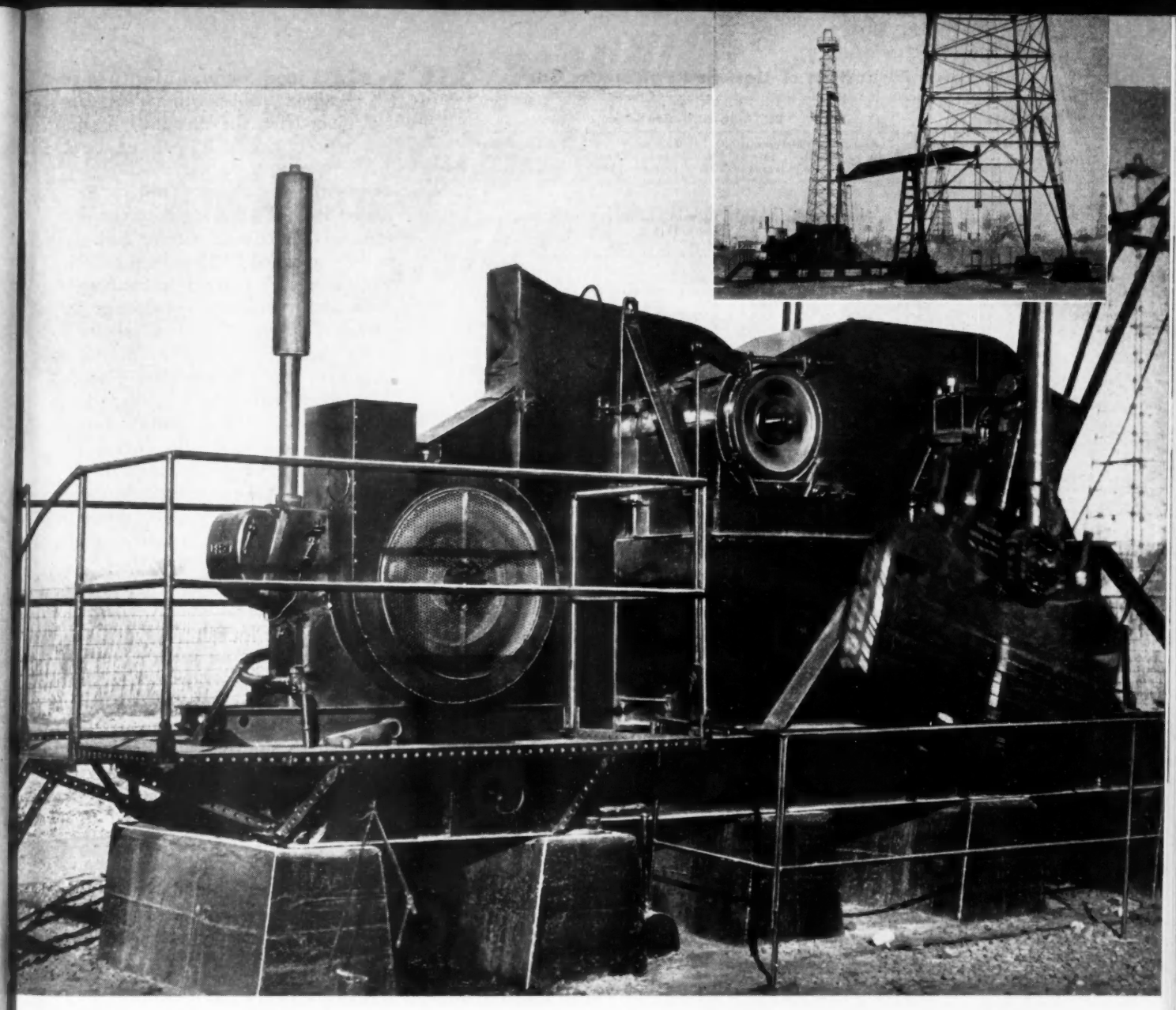


....prove that they pump oil

— longer
— at less cost
— with less maintenance

than any other well-pumping engines!

See for yourself



Cost per HP-hour only half

of what major oil company considers good for engines on well-pumping service

Installation No. 1

Le Roi A288 pumped 50 barrels water, 70 barrels oil from 6,475 feet with an estimated load of 11-12 HP.

A288 operated for 1078 24-hour days — without being overhauled!

Operating cost per day — including pumpers' wages, fuel, and maintenance — only 90 cents!

Installation No. 2

Le Roi A288 pumped 180 barrels water, 10 barrels oil from about 6,475 feet with a load of 18 HP.

A288 operated for 911 24-hour days. Maintenance cost was only $.0017/HP-hr.

Operating cost per day — including pumpers' wages, fuel, and maintenance — only 69 cents!

That's real dependability! And economy! It's the kind of profitable performance Le Roi A288 owners in every producing area get every day.

And it's performance *you*, too, can have. See your supply house or Le Roi distributor — ask them to show you A288 installations. And have them tell you the reasons why the A288 is the only engine to be recommended by one major pumping-engine user for continuous service unattended for up to two weeks at a time!

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Southern Engine and Pump Company—Houston, Kilgore, Edinburg, Dallas, San Antonio, Corpus Christi, Texas, and Lafayette, Houma, New Orleans, Louisiana

North & West Texas, New Mexico
General Machine & Supply Co.—Odessa, Snyder, Texas
Nortex Engine & Equipment Co.—Wichita Falls, Texas

Kansas
Carson Machine and Supply Co.—Great Bend

Michigan
Hafer Engine Service—Reed City

Rocky Mountain Area
Gehring Equipment Co.—Casper, Wyoming, Rengeley, Col.

Mississippi, Arkansas and Northern Louisiana
Ingersoll Corporation—Shreveport, Louisiana, El Dorado, Arkansas, and Jackson, Clarksdale, Mississippi

West Coast
Le Roi Engine Sales Co.—Long Beach, California

Appalachian Area
P. C. McKenzie Co., Pittsburgh, Bradford

Canada
Lucey Export Ltd.—Calgary, Edmonton, Alberta

Marketed Production of Liquefied Petroleum Gas*

Year	TOTAL SALES		DISTRIBUTION—1000 Gallons									
	Gallons (in Thousands)	Percent Increase	Domestic & Motor Fuel[1]	Percent Increase	Industrial Miscellaneous[2]	Percent Increase	Gas Mfg.	Percent Increase	Chemical Mfg.	Percent Increase	Rubber Components	Percent Increase
1922	223	.....										
1923	277	24.4										
1924	376	36.0	Sale of Liquefied Petroleum Gas Confined primarily to Bottled Gas Business Prior to 1928									
1925	404	7.2										
1926	465	15.2										
1927	1,091	134.6										
1928	4,523	314.6	2,600	.....	400	.....	1,500	.....	.....	.....	.....	.....
1929	9,931	119.6	5,900	126.9	1,500	275.0	2,500	66.7	.....	.....	.....	.....
1930	18,017	81.4	11,800	100.0	2,200	46.7	4,000	60.0	.....	.....	.....	.....
1931	28,770	59.7	15,295	29.6	7,172	226.0	6,303	57.6	.....	.....	.....	.....
1932	34,115	18.6	16,244	6.2	8,167	13.9	9,703	53.9	.....	.....	.....	.....
1933	38,931	14.1	16,626	2.3	13,987	71.3	8,318	—14.3	.....	.....	.....	.....
1934	56,427	44.9	17,681	6.3	32,448	132.0	6,298	—24.3	.....	.....	.....	.....
1935	76,855	36.2	21,380	20.9	47,894	47.6	7,581	20.4	.....	.....	.....	.....
1936	106,652	38.8	30,014	40.4	67,267	40.4	9,371	23.6	.....	.....	.....	.....
1937	141,400	32.6	40,823	36.0	62,610	[3]	11,175	19.3	26,792	.....	.....	.....
1938	165,201	16.8	57,832	41.7	62,694	0.0	12,386	10.8	32,299	20.5	.....	.....
1939	223,580	35.3	87,530	51.4	93,723	49.4	15,435	24.6	26,892	—16.7	.....	.....
1940	313,456	40.2	134,018	53.1	124,482	32.8	20,285	31.4	34,671	29.0	.....	.....
1941	462,852	47.7	220,722	64.7	172,669	68.6	25,255	24.5	44,206	27.5	.....	.....
1942	585,440	26.5	303,857	37.6	197,179	14.2	31,366	24.2	53,038	20.0	.....	.....
1943	675,233	15.3	344,962	13.6	237,396	20.4	37,519	19.6	55,356	4.4	.....	.....
1944	898,071	33.0	445,617	29.2	254,590	7.3	45,879	22.3	151,985	175.0	.....	.....
1945	1,067,979	19.0	533,262	19.7	256,577	0.8	53,849	17.4	224,291	47.5	.....	.....
1946	1,410,370	32.1	758,466	42.2	253,745	—1.1	86,660	61.0	311,499	38.8	.....	.....
1947	2,209,797	42.4	1,150,538	51.7	274,125	8.0	169,332	95.4	414,267	33.0	201,535	.....
1948	2,736,801	25.0	1,473,289	28.1	275,883	0.6	237,638	40.3	524,350	26.6	225,641	11.9
1949	2,836,599	5.9	1,627,550	10.5	247,103	—10.4	239,210	0.6	544,886	3.9	177,850	—21.1
1950	3,482,567	22.4	2,022,464	24.3	355,456	[4]	251,694	5.2	624,468	14.6	228,485	24.7
1951	4,227,275	18.4	2,456,804	21.6	269,408	[4]	281,692	11.9	844,507	35.2	374,864	64.5
1952	4,477,379	5.9	2,636,736	7.4	338,959	26.0	259,697	—7.8	870,990	3.1	370,997	—1.1
1953	4,920,000	9.9	2,932,000	11.2	326,000	—2.9	247,000	—5.0	1,016,000	16.6	399,000	7.5

[1] Household use plus other requirements by these customers such as irrigation pumping, tractor fuel, flame weeding, chicken brooding and similar uses. Included also is LPG sold by domestic distributors but used for industrial purposes. Included also, in 1951, 1952 and 1953 only, is LPG sold direct by producers and marketers solely for fueling internal combustion engines.

[2] For all years prior to 1951, include LPG sold for refueling internal combustion engines.

[3] Not comparable due to segregation of chemical manufacturing.

[4] Not comparable due to change in method of reporting LPG sold for refueling internal combustion engines.

* LP-Gas used for manufacture of synthetic rubber components is included in this report for the first time this year.

REMARKS: In this table total sales for all years except 1953 were obtained from U.S. Bureau of Mines reports. Distribution for the years 1931 to 1952, inclusive, was obtained from the same source. All other volumes were estimated by the writers. The total sales volume includes all LPG (propane, butane and propane-butane mixtures) when sold as such. Until 1944 the sale of pentane when sold for any purpose other than motor fuel blending was included. Since then it has been excluded. It does not include butane when blended with heavier petroleum fractions for motor gasoline purposes. Intercompany sales transactions such as purchases of LPG by one company from other companies and resold as LPG have been eliminated in order to avoid duplication of sales figures.

LPG . . . sales up during 1953. Interest running high.

Continued growth is indicated.

By GEO. R. BENZ and PAUL W. TUCKER,
Phillips Petroleum Company, Bartlesville, Okla.

SALES OF LIQUEFIED petroleum gas approached a new volume milestone in 1953 with a healthy gain over 1952. Outlook is for greater emphasis on sales backed up by increased LPG production and increased transportation facilities.

Highlights—The sale of LPG in 1953 are estimated to be 4,920 million gallons, or nearly 10 percent more than the 1952 volume. This is an increase of almost 443 million gallons and nearly double the gallonage increase registered during the preceding year. New production, transportation, distribution and storage facilities emphasize the need for greater sales effort in 1954.

- Domestic and motor fuel use is estimated "up" over 295 million gallons or 11.2 percent.
- Industrial and miscellaneous is down by nearly 3 percent.
- Gas manufacturing or utility use dropped 5 percent.
- Chemical use registered the largest single category increase by a gain of 16.6 percent during the year.
- LPG used for manufacture of synthetic rubber components (included for the first time in this report) gained 7.5 percent.

Domestic and Motor Fuel — Estimated sales of LPG for domestic and internal combustion engine fuel use in 1953 reached 2,932 million gallons. This is a 11.2 percent increase over 1952 and represents a gallonage increase of nearly 300 million gallons.

As usual, the weather played a dominant part in the sales picture. The above average temperatures which prevailed throughout most of the year, and especially during the first and last quarters, reduced the demand of LPG for heating purposes and thus somewhat lowered the banner sales peak the industry might otherwise have easily achieved.

The industry enjoyed a good summer from a sales standpoint. There are several reasons for this:

- The tremendous amount required in the southwest for irrigation.
- Increased use as a tractor fuel.
- The filling of customer and bulk distributor's storage.

The latter doubtless reflects to some degree the success of the efforts of the National Committee for LPG promotion, which has been advocating larger storage as one of its programs.

House heating continues to increase. The increase in bulk consumer installations and in farm or agricultural applications continued unabated throughout the year.

While it is extremely difficult to "pin-point" the amount of LPG used as engine fuel, it is conservatively estimated that this use alone required nearly 500 million gallons in 1953, or almost 10 percent of the total sales.

A recent survey indicates that about 2000 buses will be operating on LPG by the end of 1953. One of the most surprising developments during the year was the development of interest in the use of LPG as motor fuel for industrial tractors and lift trucks. Several of the major manufacturers are now offering factory-equipped LPG models.

Industrial and Miscellaneous Uses —The amount of LPG used for industrial and miscellaneous application is estimated to have dropped 2.9 percent during 1953. Actually, the drop in industrial use by itself is estimated to be down 5 or 6 percent, but the in-

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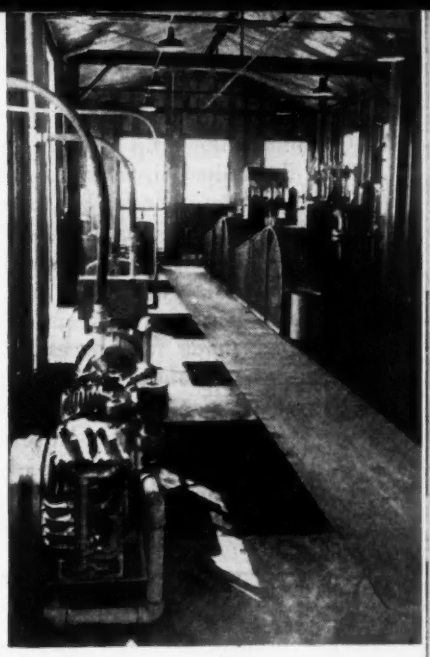
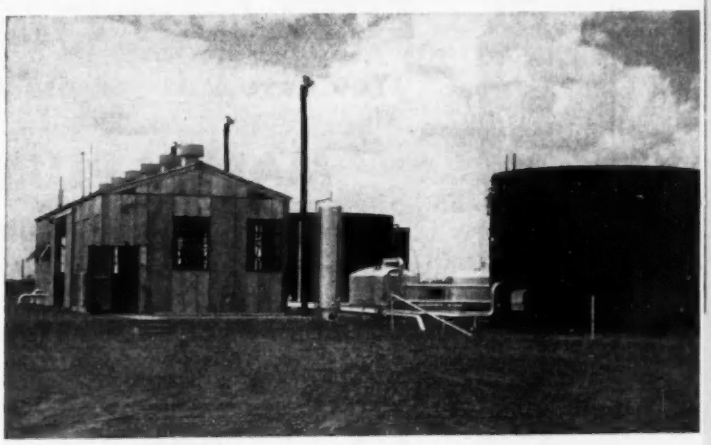


On leases where secondary recovery is feasible, waterflooding is often the best answer. It is accounting for big yields in many areas where conventional production methods have ceased to be profitable. Waterflooding is something definitely to be considered before writing off a lease as "worked out."

If you are planning such a system, we strongly suggest you talk with Bethlehem Supply. We have engineers who specialize in waterflooding work, and their broad experience can be very helpful to you and your staff. In addition, Bethlehem is able to furnish complete equipment for a waterflooding layout—the buildings, water-treating and injection facilities, pipe lines, valves, surface pumps, compressors, storage tanks, prime movers, generators, controls, substations, line poles, wiring, pumping units of various sizes and types, sucker rods, and bottom-hole pumps.



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crease in miscellaneous uses tended to minimize the drop. The main reason for the reduction in industrial use of LPG is the extensions of natural gas lines or increases made in the capacity of existing lines. The "standby" sales for industrial uses were not up to normal because the relatively mild weather made it unnecessary to operate the "standby" plants in many cases.

The railroads have expressed an active interest in LPG flame weeding for maintenance of right of ways because preliminary studies and trials indicate that flame weeding is cheaper than chemical treating. The railroads are also watching with more than average interest an experiment of the Union Pacific with an LPG fired turbine locomotive.

Utility Use—Sales of LPG for gas manufacturing purposes are estimated to be 247 million gallons—a decrease of 5 percent compared to 1952. There are two factors accounting for this decrease:

- The above average temperatures which prevailed over large segments of the country during the year.
- The change over to natural gas.

Chemical Manufacture — Sales of LPG as a raw material for the manufacture of chemicals and chemical intermediates rose sharply, after a moderate increase the previous year, passing the one billion gallon mark. The estimated sales were 1,016 million gallons, representing an increase of 16.6 percent over 1952.

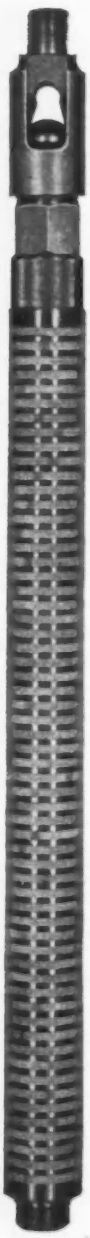
Rubber—The use of LPG as a raw material for the manufacture of synthetic rubber components increased an estimated 7.5 percent so that the total volume for this use approaches 400 million gallons annually.

The Rubber Producing Facilities Disposal Commission has been entrusted by Congress with the disposition of the government-owned synthetic rubber facilities. This Commission has announced that it will receive bids until May 27, 1954.

Safety Standards—Because of the rapid and varied growth of the LPG industry, it is necessary that the safety standards be continually revised and enlarged to keep pace. This activity has been very prominent and fruitful this year. The continuing growth of the LPG motor fuel market has indicated the desirability of enlarging the industry standards (National Fire Protection Association Standard No. 58) by adding a section devoted exclusively to LPG service stations.

This work is currently being considered by the NFPA. Other changes in the standards reflect the rapidly growing interest in the use of LPG as fuel for industrial tractors and lift trucks and for truck cargo heaters. Standards have been completed covering the joint storage of LPG and flammable liquids.

Supply—As might be expected, a sales increase of nearly 450 million gallons requires new sources of production. The production segment of the industry kept pace with the addition of 15 plants during the year which have an estimated production capacity of 550 million gallons per year. Notable among the new plants coming "on-stream" was the National Petro-Chemical Corporation plant at Tuscola, Ill. Additional production during the year was curtailed by a "shut-down" order of the Texas Railroad Commission for plants in the Spraberry Trend of West Texas.



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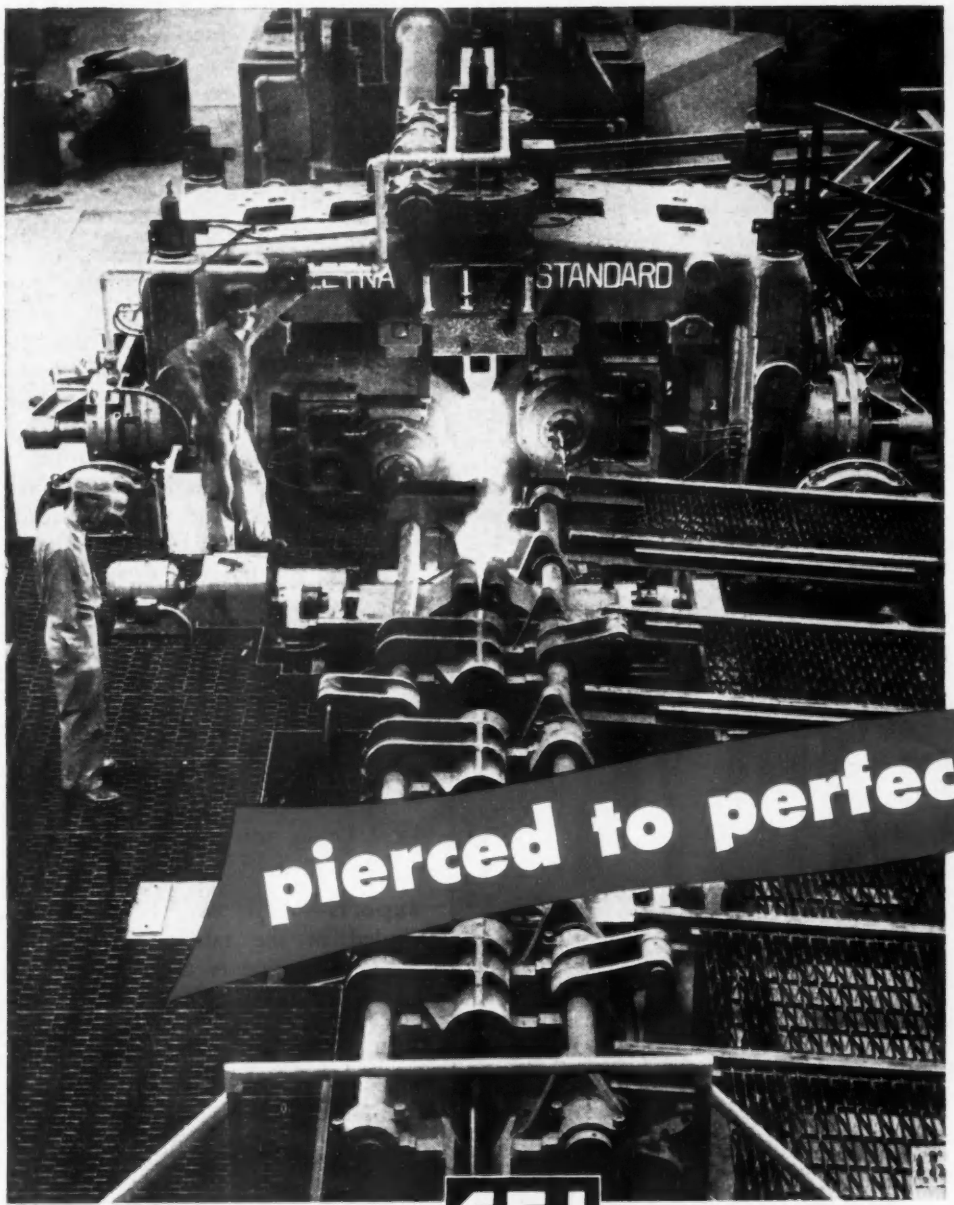

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DENVER, COLORADO

Next year it is estimated that at least twelve new plants will come "on-stream" with more than 220 million gallons capacity. This includes two new Canadian plants and a new plant in the Williston Basin in North Dakota.

It is interesting to note that the percentage of LPG from refineries continues its gradual decline. Five years ago 33.3 percent of LPG came from refineries, and this year it will be about 28 percent.

Storage—The storage "picture" is the brightest perhaps that it has ever been. It is estimated that there are 67 completed underground storage installations having a capacity of over 205 million gallons. There are 76 more such installations either under consideration or construction which will have a capacity of around 285 million gallons. By far the greatest amount of this underground storage is of the type which is washed out of salt beds or domes, though there are a number of the mined caverns under construction. One company has about completed the "sealing" of an abandoned railroad tunnel which will be used for LPG storage. This storage, however, does not obviate the necessity for continued emphasis on adequate consumer storage, new and increased summer "loads," planned deliveries, etc.

Transportation—There are now an estimated 23,500 "high pressure" cars in service. About 7000 of these are in chemical service which means that nearly 16,500 are LPG cars. It is also estimated that nearly 2100 LPG cars were added during the year. The search for lower cost transportation continues. A new seagoing LPG barge to serve Florida and Cuban markets has just been launched. This is the first seagoing barge designed to haul LPG exclusively.

Pipe line movements increased during the year. Truck movements of LPG showed a big increase during the year. The underground storage program is one reason for this increase because every time a new storage facility is completed it will increase local truck movements from that point.

Exports—While exports are not included in the table or total sales figures, it appears that exports will amount to nearly 120 million gallons representing almost a 30 percent gain over last year. As in the past, the principal export market is Canada and Mexico.

Outlook—Interest in the industry and its possibilities for continued growth continue strong. The industry is entering the year of 1954 in an excellent position to further expand its sales, since recently completed manufacturing facilities are now producing on a full-time basis, and additional new plants will come on stream in 1954, all forms of LPG transportation (truck, pipe line, rail and water) have been greatly increased, producer's plant storage has been materially expanded principally by addition of underground storage, and steel for tanks and appliances should be readily available.

This coming year promises to bring greater emphasis on sales and sales promotion. This drive for new business will not only be to secure new LPG customers, but also to secure new "load-building" uses at present customers. This latter is expected to be an important factor in the industry's future growth.—**The End.**

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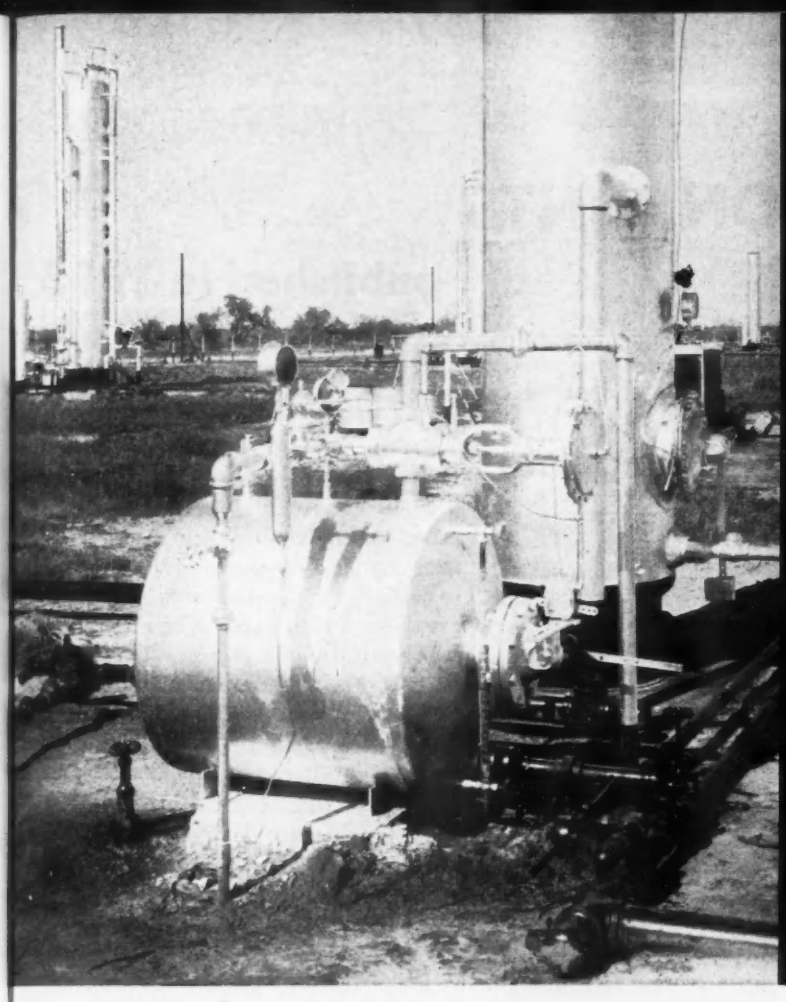

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NOTHING TO MIX

1

BORASCU is applied dry — directly from sack to soil — prior to seasonal rains; becomes effective when dissolved and soaked into soil.

Just a man . . .
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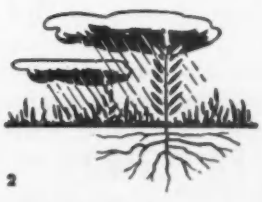
. . . and BORASCU

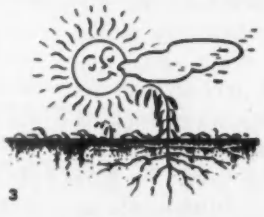
NO WATER TO HAUL



2

RAINFALL adds Borascu to soil solution; quickly carries it to all roots in control area.

NO MORE WEEDS



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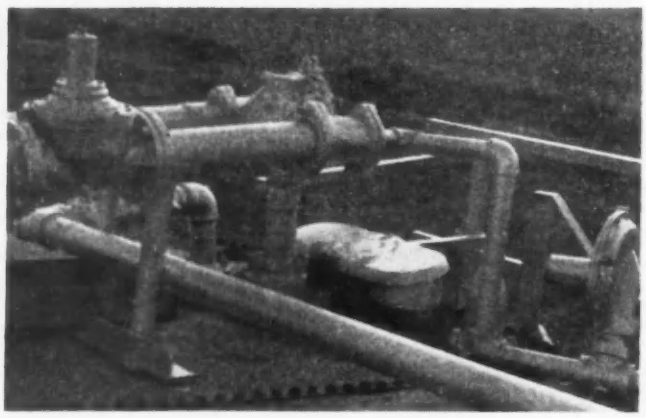
10 BEST PRODUCTION HINTS

. . . . published in 1953

Here are the ten best Production Hints of 1953 selected by a panel of seven experts. The group included a general manager of drilling and production, the general superintendent of a major production company, 2 chief petroleum engineers, the production superintendent of an independent oil company, and 2 district superintendents.

Sweet Gas Makes Sour Crude Gauging Safe



One of the most dangerous hazards in production operations is that of gauging tanks containing sour crude. High concentrations of hydrogen sulphide gas can paralyze and kill without warning; smaller concentrations can cause black-outs. Tank gaugers are exposed to this hazard when running a gauging tape through the tank hatch.

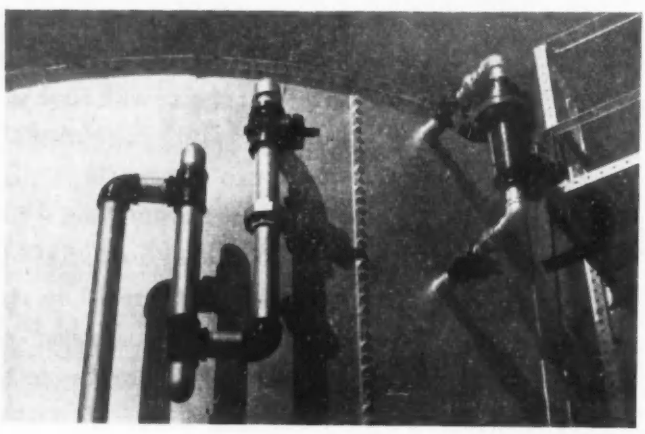
This hazard may be minimized by maintaining a blanket of "sweet" gas on top of the sour crude. When the gauger opens the hatch, sweet gas rises so that little of the H_2S gas escapes the tank. Such practices also prevent the poisonous gas from killing crops or livestock on the lease, since the gas is heavier than air and will settle on the ground.

Field gas from a sweet gas well is piped to the battery and reduced to four ounces of pressure. The tank vent line is equipped with a pressure regulator which opens when this pressure exceeds four ounces. This regulator is shown in the left of the photo.

The vent line, of four-inch pipe, is equipped with a bypass line around this regulator, so that the line may be opened to the atmosphere to take some of the gas off the tank prior to gauging. This bypass is controlled by a quick-action two-way valve located on the gas vent riser just in front of the gauge hatch.

Just before gauging a tank of sour crude, the gauger throws the two-way valve to bypass the regulator, waits a moment, then opens the gauge hatch and makes his tank gauge.

U-Tube Seals Off Tank Fill Line



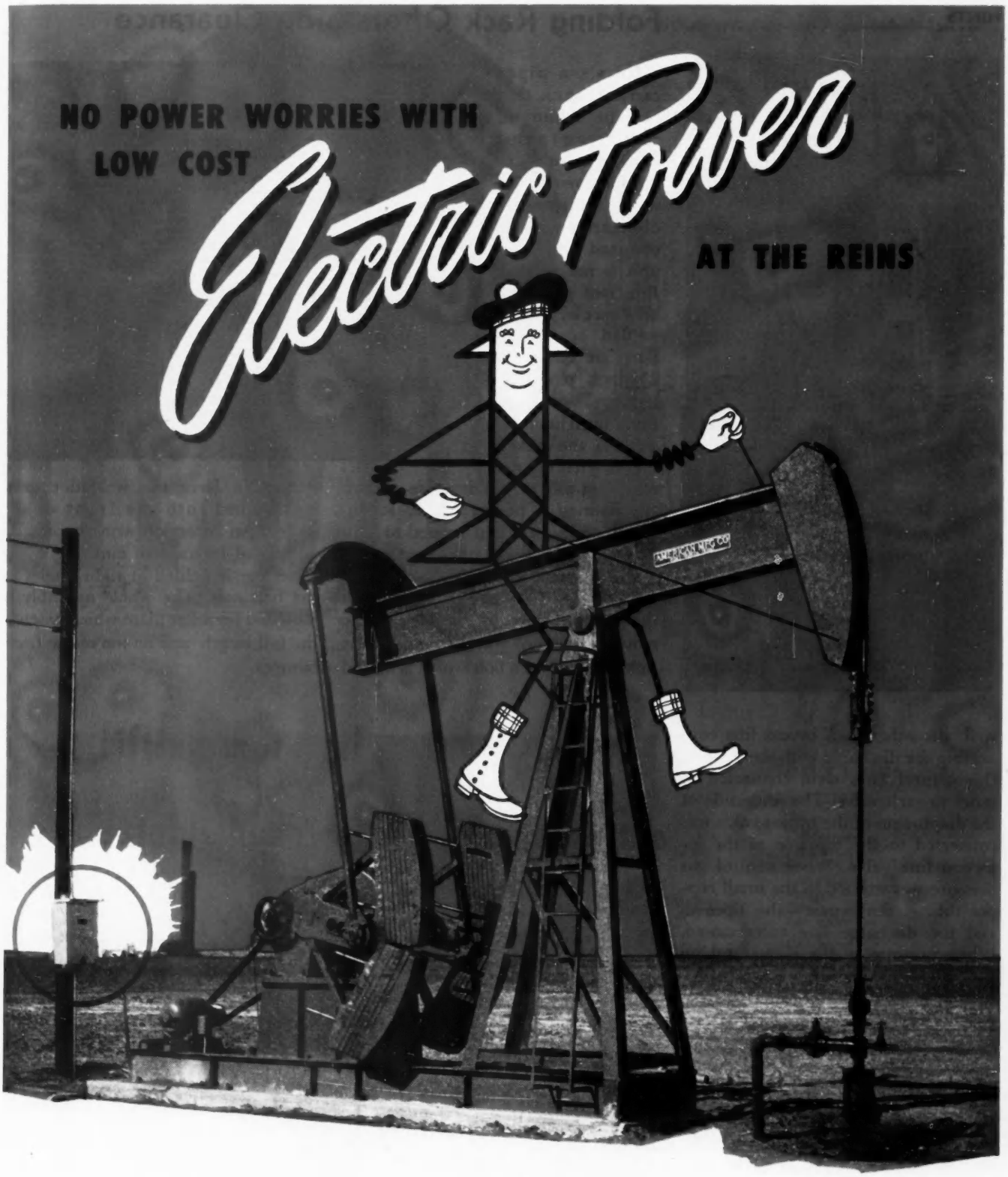
Install a U-tube arrangement on the fill line of a water tank used to store flood water to prevent air from entering the tank should the fill line be disconnected at the ground for any reason. Eliminating air from coming in contact with salt water used in a water flood project minimizes the treating problem. Shown here is the upper part of a water storage tank that supplies the flood water to an injection pump. The water has already been properly filtered and treated, and in order to keep air out, about four ounces of gas pressure are maintained on the tank.

A U-tube section is made into this line near the connection into the upper part of the tank. If this line needs to be disconnected at the surface, water in the vertical run alongside the tank will drain, but that water in the U-tube section will remain in the pipe. This water forms a seal against the atmosphere so that air will not enter the tank. To prevent a syphon effect from draining the U-tube, the bull plug at the top of the left leg is removed until the line is ready for service again. When the water begins to flow into the fill line and overflows out the top of the tee in the U-tube, the bull plug is replaced. Air never gets into the line to contaminate the gas cushion on top of the water.

Regulators Control Disposal of Brine

A closed salt water disposal system incorporated an assembly of gas-operated regulators which automatically controlled the flow of brine through the system and into the disposal well. Since the injection of salt water is not a continuous process, an automatic method was devised so that brine could be circulated from the discharge back into the suction of the centrifugal pump. This pump was operating continuously, although it would speed up when pressure was needed for injection purposes.

Heart of the auto system is a pair of regulators: one placed in the pump discharge line leading to the disposal



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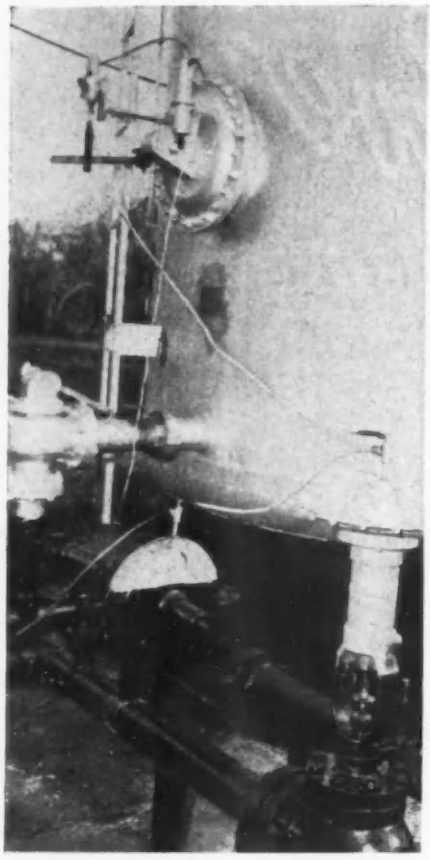
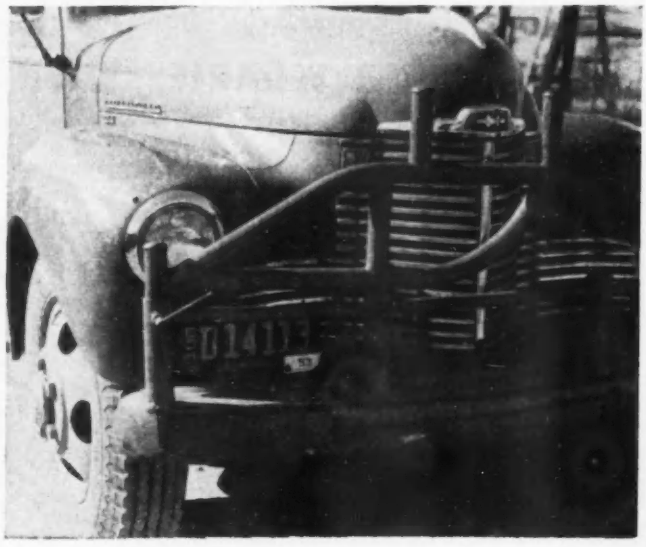


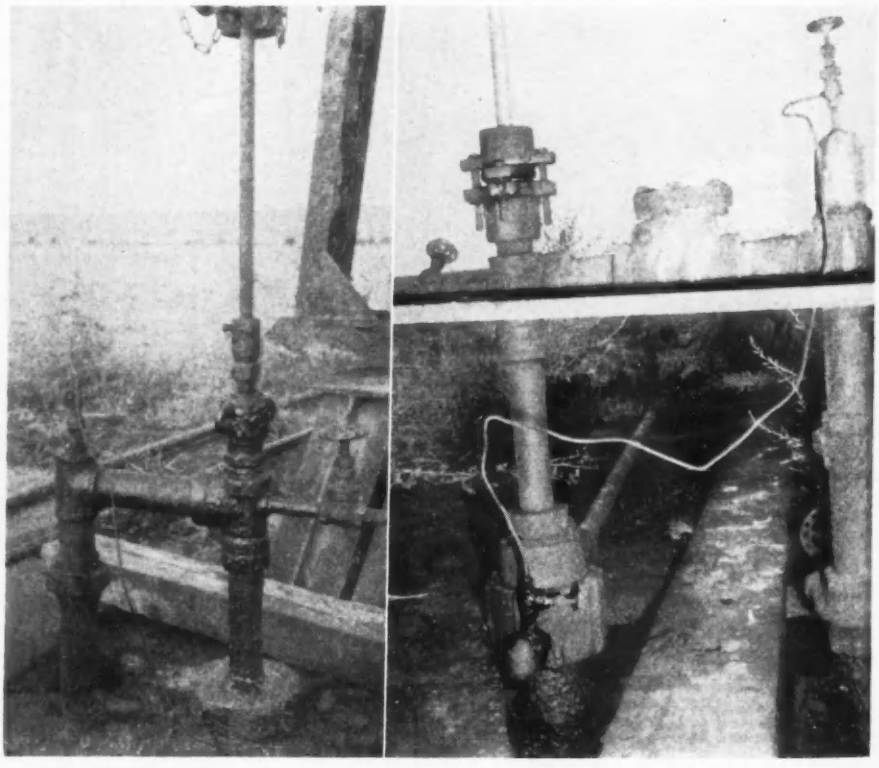
well, the other in a bypass line connecting the discharge with the suction. Gas control lines were connected in series to each valve. The underside of the diaphragm of the bypass valve was connected to the top side of the injection line valve. When control gas pressure was exerted in the small copper tubing, the bypass valve opened, and the discharge line valve closed. When pressure in the copper tubing was exhausted, the reverse occurred.

Control gas was supplied from the field gas system, and was reduced to about 20 pounds. A small sliding valve served as the controlling mechanism for both valves. In one position, it caused the diaphragms of the two valves to be pressurized; in the opposite position, it exhausted the control lines. This valve was operated by a float inside the accumulator tank of the closed system. As the water level in the accumulator tank dropped to a predetermined level, the control valve would cause the discharge line valve to close and the bypass valve to open. In this manner, the pump circulated salt water until the accumulator tank filled.

Folding Rack Offers Side Clearance



Here's a pipe-carrying rack that can be removed easily, rotated through 180 degrees and reinstalled so maximum side clearance can be obtained when the unit is not needed. Principal parts of the rack, of all welded construction, are of 2 and 2½-inch pipe materials. Two of the four upright posts serve as the sockets into which two matching pins of the movable portion are inserted. The rack is in its inboard position. When needed to support a load of long tubing or sucker rods, the unit is lifted us, rotated through 180 degrees and reinserted in the sockets. Each of the legs of the movable section may be secured by tightening down a bolt which is turned through a large nut welded over a hole burned into the front of the socket. An extension arm to provide additional leverage in cinching down these legs is welded at right angles to the bolt axis. The whole assembly is mounted on a flat plate which extends the full length, and on top of the front bumper.



Gas from Tubing Head Used in Pump Engine

When a pumping well barely supplies enough gas to operate the pumping engine, the gas which comes off the tubing head may be added to the

"GOOD WILL" is the disposition of the pleased customer to return to the place where he has been well treated.
—U. S. SUPREME COURT

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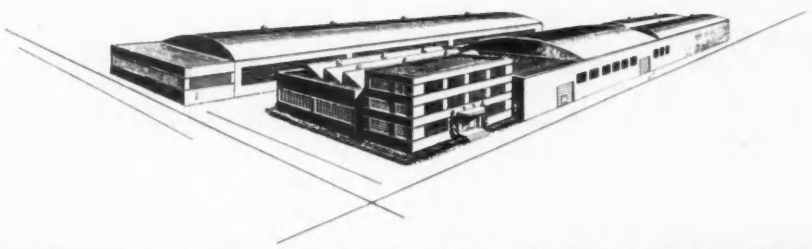

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Tulsa

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Snyder
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Quitman

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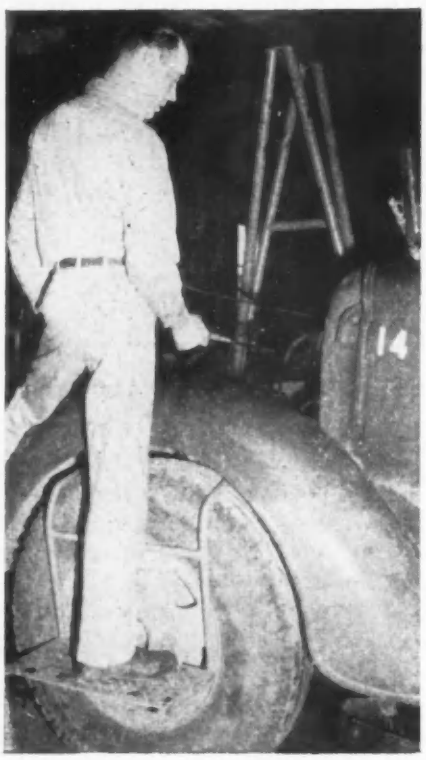
casing head gas in a simple manner. The arrangement consists merely of a copper tubing connecting a bull plug looking up on the flow line to the "other" side of the casing head; the other side being away from the connection leading to the fuel system of the engine.

In operation, the hose connection is taken loose from the casing head and the needle valve cracked on the bull plug to allow all the gas and a small amount of oil to flow through the copper tubing. Since the gas is taken off the top of the line, all the gas that the tubing head makes is stripped from the oil produced.

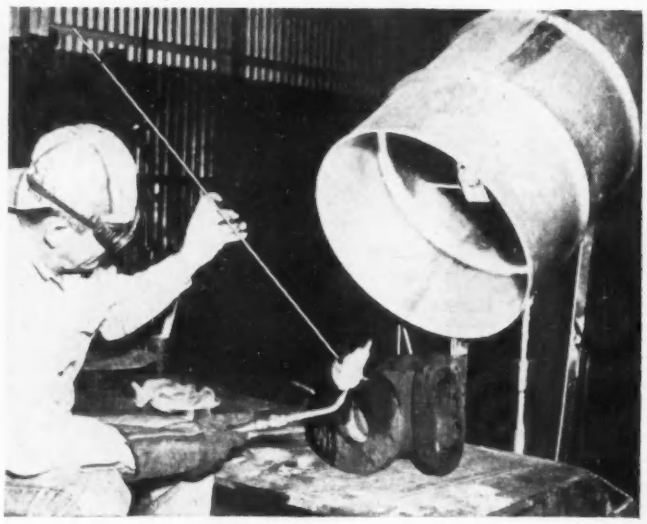


Wheel Step Aids In Engine Repair

A simple step to stand on to make it easy to repair truck engines may be made from materials on hand. This step has loops which hang over the front tire so that the mechanic can slip them in place easily.

The step is cut from a piece of floor plate approximately 10 inches by 20 inches. The remainder of the device is made from sucker rod material or bar stock. Two pieces, each approximately four feet long are bent in the same shape with a 90-degree bend at the bottom to fit the floor plate section.

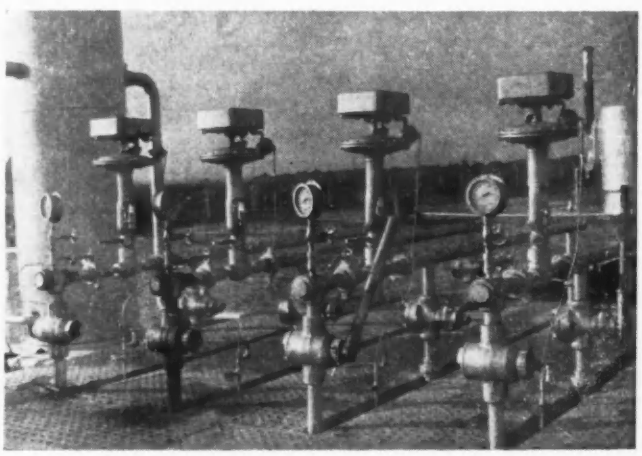
Exhauster Removes Welding Fumes



Fumes and smoke emanating from oxy-acetylene or electric arc welding can be discharged from the immediate vicinity of the welder by a shop-made device known as an exhauster. Made from a salvaged steel drum, an electric motor and fan blade, the exhauster is mounted on an adjustable stand so that it can be directed away from the work at any desired angle.

Mount the electric motor inside the middle of the steel drum on four-way brackets welded to the inside of the drum walls. Pass the electric cord through a hole cut in the bottom of the drum to supply the motor with electricity.

Intermitters on Line Control Flow



Shutting-in and opening flowing wells to conform to proration schedules can be greatly simplified at considerable time savings by using intermitters on the flow lines located at the tank battery. In one case flow lines from four flowing wells terminate at this manifold. To comply with proration schedules each well must be shut in a different length of time each day. These wells are strong producers and are not affected by daily shut in periods, for they resume flow without any difficulty.

Shut in pressures in each case is not great, perhaps less than 250 pounds per square inch. At the tank battery, each flow line connects into a header equipped with a gas-lift type intermitter, the function of which is only to open and close the flow line at predetermined periods. A bypass line is incorporated in the manifold should it be necessary to bypass the fluid around the intermitter valve.

Each header containing the intermitter has a removable choke to keep downstream pressures fairly constant. This insures a continuous flow into a common separator. Each intermitter can be staggered so that not more than two of the four wells flow into the separator at any one time, thereby insuring continuous operations of the battery so far as oil and gas flow is concerned.

Slight Gas Pressure Aids Water Pump

A slight amount of gas pressure exerted on top of a salt water accumulator tank is a material aid in flooding the suction of a centrifugal pump. Discharge of the pump is into a filter tank where the salt water is treated for injection into a disposal well.

This small 100-barrel tank of bolted

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CONDENSED STATEMENT OF CONDITION
DECEMBER 31, 1953

RESOURCES		LIABILITIES	
Cash and Due from Banks	$ 95,968,341.62	Deposits	$379,700,973.75
U. S. Government Obligations	166,103,712.93	Acceptances	2,372,177.15
State, Municipal and Other Public Bonds	10,561,498.91	Dividend Payable January 2, 1954	112,000.00
Other Bonds and Securities	535,079.29	Reserve for Taxes, Accrued Interest and Expenses	2,250,599.99
Loans and Discounts	128,299,714.10	Other Liabilities	72,197.62
Bank Premises	3,337,405.79	Capital Stock $ 2,800,000.00	
Other Real Estate	31,328.25	Surplus 17,200,000.00	
Customers' Liability Account of Acceptances	1,894,661.90	Undivided Profits 4,270,360.07	
Accrued Income and Other Assets	2,046,565.79		24,270,360.07
TOTAL	$408,778,308.58	TOTAL	$408,778,308.58

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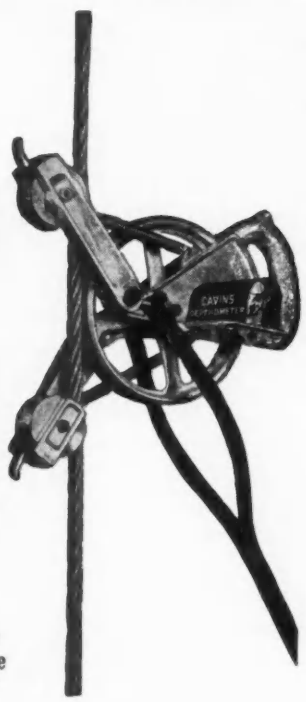

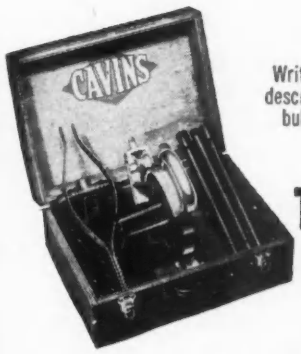

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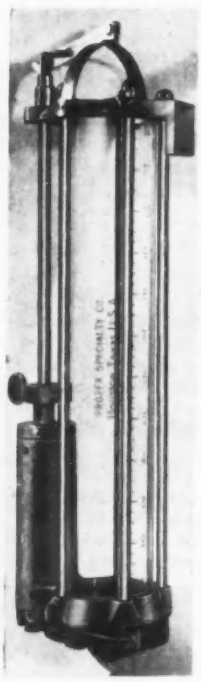

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construction is tightly covered to hold a small amount of pressure. It is an accumulator tank for collecting salt water which gravitates to the treating battery from the gun barrels of nearby leases. Difference in elevation between tank battery and treating battery is sufficient to more than overcome the gas pressure exerted on top of the water. By providing an additional suction pressure to the centrifugal pump, its efficiency is increased, and there is no difficulty encountered with a dry suction.

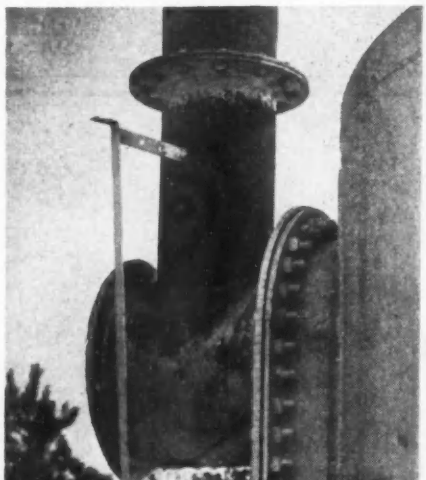
Gas from the lease supply system is piped through 1-inch line so that it comes into the tank at the top as shown. A regulator in this line reduces the gas pressure to that pressure desired. Since the tank cannot withstand much internal pressure, this figure must be carefully limited. To provide double assurance of gas pressure not bursting the tank should the regulator fail to operate, a riser is attached to the top of the tank and a bursting disc inserted between two flanges. A protective cover is attached over the flanged fitting.

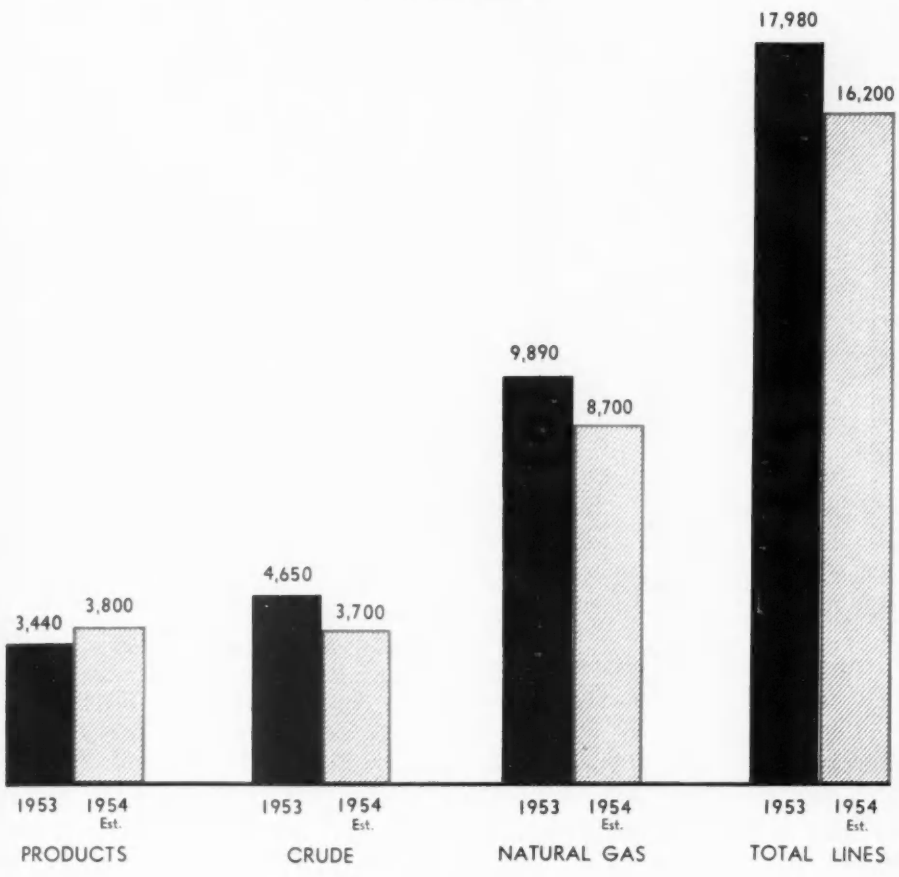
Heater Stack Has Adjustable Dampener

The amount of heat required to break emulsions may vary from season to season and with the volume of fluid handled. In many cases it is desirable to change the burner setting on the heaters. A dampener placed in the stack of the burner unit has been found useful in accomplishing this heat change.

In this particular heater, the burner assembly consists of a large horizontal "U" shaped chamber, designed so that the exhaust outlet is located directly above the burner assembly. The stack is flanged to the bottom section so that it can be easily removed. By taking the upper section of the stack off, a dampener easily can be installed in the bottom part of the stack so that the shaft extends about an inch beyond the wall of the stack. A piece of strap steel is welded to this shaft to form a pivot arm.

Position of the dampener is controlled by a vertical arm made from strap steel and hinged to the pivot arm of the dampener. This vertical member can be raised or lowered by changing its position in a punched plate cut in the shape of a pie section. This section, representing a quarter of a circle, is welded to the housing of the burner assembly. Some 15 holes in this plate provide a multiple of settings to properly adjust the dampener so that the correct amount of heat is transmitted to the liquid contents of the heater.





U. S. Pipe Lines . . . 16,200 miles of new lines to be built in 1954. Construction lessens.

By **DONALD M. TAYLOR,** WORLD OIL Staff

THE U. S. PIPE LINE network will continue to expand rapidly in the year ahead, although construction of new lines will fall at least 10 percent below the 1953 level. WORLD OIL forecasts that 16,200 miles of new lines will be laid in 1954. This figure includes lines four inches and larger in diameter laid for crude, products or natural gas outside corporate city limits. This compares with 17,980 miles laid in 1953.

A year ago WORLD OIL forecast that approximately 13,900 miles of new lines would be completed in 1953. Toward the end of the year, it became obvious that this figure would fall within a percent or so of absolute accuracy. In November, PAD had predicted that 8700 miles of new crude and products lines would be completed by year's end, and in January the American Gas Association placed the miles of cross-country gas lines at 5000 miles completed for the year. This gave a total of 13,700 miles. This figure has since been generally used as the tally for the year.

But WORLD OIL statisticians felt the figure would not tell the full story of 1953 construction. It left out lines which did not come under jurisdiction of Washington. Also, a number of major oil companies had constructed large diameter gas gathering systems—for gasoline plants and for pipe line tie-in. Also, the figures above were limited to lines which were completed and in operation, and left no allowance for lines which mainly were constructed in 1953 but not placed in operation.

For this reason industry leaders were asked to help prepare an accurate total of lines constructed during the year. An overwhelming majority replied—as a matter of fact, 88 percent of the 1953 pipe lines total (or 15,793 miles) was reported. This took the guesswork out of the report on 1953 construction.

In addition to requested information on last year's construction, company officials were queried on 1954 construction plans, both gathering lines and main lines. Their response formed the basis for forecast figures in the accompanying tabulations.

Note that the tabulated figures are limited to construction inside the continental U. S.

Natural Gas Pipe Lines

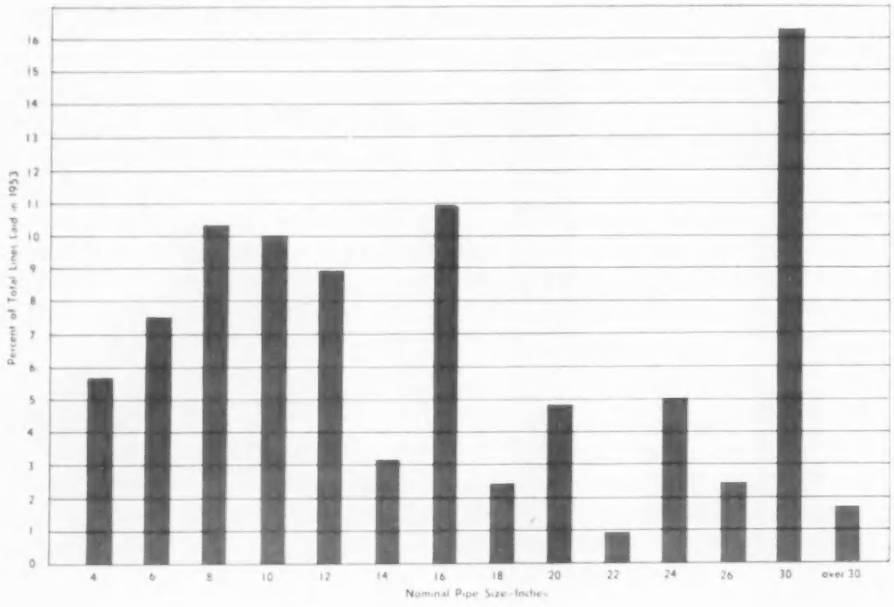
In 1954 as in 1953, natural gas systems will lead the field in pipe line expansion. This industrial giant of the postwar period has yet to satisfy the needs of voracious markets. Hundreds of thousands of homeowners eagerly await natural gas service; industrial customers, who take the bulk of gas on an interrupted basis, are clamoring for additional gas supplies. Moreover, this market is not a static one. It continues to grow as population and industry expand.

To meet the demands of this grow-

Pipe Lines Laid in 1953, by Pipe Size

Nominal Pipe Size, Inches	Miles Laid in 1953	Percent of Total
4	1,017	5.7
5	13	0.1
6	1,354	7.5
8	1,848	10.3
10	1,799	10.0
12	1,601	8.9
14	565	3.1
16	1,967	10.9
18	423	2.4
20	865	4.8
22	157	0.9
24	895	5.0
26	426	2.4
30	2,919	16.2
Over 30	131	0.7
Unclassified	2,000	11.1
	17,980	100.0

Distribution of Pipe Sizes for All Lines Laid in U. S. During 1953



ing market, the oil industry is earmarking more and more exploration dollars for finding new gas fields, and pipe line companies are spending vast sums on looping programs and compressor station horsepower. The American Gas Association estimates that natural gas pipe line companies will spend nearly $2 billion in the next three years to increase transmission facilities.

In 1953 the U. S. gas industry constructed 9890 miles of pipe lines (four inches and larger—not including city distribution systems), 6930 miles were main lines and 2960 miles were field gathering lines. The size of the latter ranged from 4 to 30 inches in diameter.

Eighty-four companies contributed to this total. The largest single constructor was El Paso Natural Gas Company, which constructed over 800 miles of transmission line and 1200 miles of gathering system, bringing its total to more than 2000 miles. Northern Natural Gas Company and Permian Basin Pipeline Company racked up a total of more than 900 miles of line, while Southern Natural Gas Company laid 800 miles. Thirteen of the 84 companies constructed less than ten miles of line, two of them only one mile.

But gas companies were not the only ones to build gas lines. One of the major oil companies constructed 111 miles of gas gathering lines and several gasoline plant projects completed more than 50 miles of lines, four-inch and larger.

Estimates of 1954 natural gas pipe

covers all phases . . . .

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line construction stand at 8700 miles of new lines. WORLD OIL forecasts that 6700 miles of this total will be main line and 2000 miles will be gathering system.

Backing up this forecast are the confidential reports in which various pipe line companies divulged plans for 1954. Other reports, such as contracted construction FPC releases, etc., furnished supplementary information. As it stands today, 4831 miles of new lines will be constructed whether or not FPC approves other projects for the year.

Product Lines

The time may come when most service stations are supplied with gasoline by pipe line. This may seem farfetched, but during the year at least three service stations were hooked onto products lines which ran near them.

Of course, it probably will be a long time before run-of-the-mill service stations are supplied by pipe line, but the one instance above points up a basic fact. Pipe lines afford the most inexpensive means of transporting large volumes of refined products in overland shipments.

In the future more and more bulk stations will be served by pipe lines and with enormous savings. For example, where volumes run as high as 10,000 barrels per day over a distance of 100 miles, pipe lines can save $1,250,000 per year.

Evidence that the industry is thinking in these terms is borne out by the increase in products pipe line construction. In 1953 there were 3440 miles of new lines added to the products pipe line network. And in 1954 there will be about 3800 miles of new lines added to the U. S. total.

Most of the extensive systems scheduled for 1954 construction are joint ventures. There is a sound reason for this. Several companies with markets in one area can combine forces to install a single large pipe line rather than individual small ones. Operating expense for a 12-inch line is no higher than a single 6-inch line; while operating expense for two 6-

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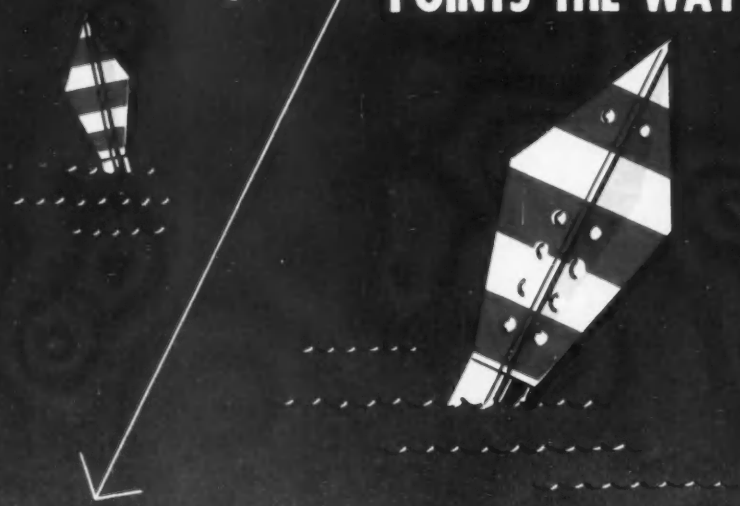

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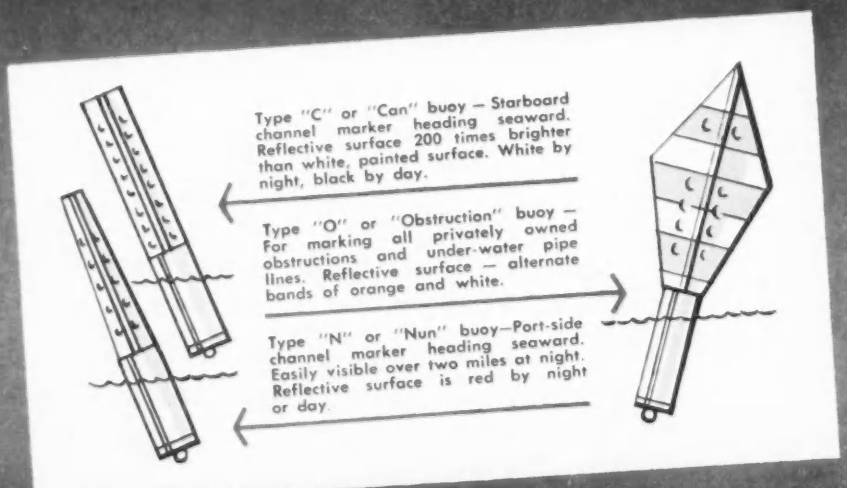
Type "C" or "Can" buoy — Starboard channel marker heading seaward. Reflective surface 200 times brighter than white, painted surface. White by night, black by day.
Type "O" or "Obstruction" buoy — For marking all privately owned obstructions and under-water pipe lines. Reflective surface — alternate bands of orange and white.
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inch lines is double that of a single line. This is why there will be a number of new products pipe line systems organized during the year.

Replies which WORLD OIL received from the various pipe line firms indicate that companies will construct at least 2411 miles of new products lines. Added to this is a total of 880 miles of new lines planned and likely to be constructed. Several companies indicated they are planning to participate in products line ventures, but the plans have yet to be approved by prospective member companies.

Since products lines seldom have the diameter or length of crude lines, they can be planned, approved and constructed in a few months. For this reason, WORLD OIL has estimated that 500 miles or more of lines not yet announced will be constructed during the year.

One of the important trends which should become manifest during the year will result from the big-inch crude systems which have been completed into the Chicago and St. Louis refining areas. With additional crude supplies on hand, and expanded refining capacities, there should be added incentive to increase the network of lines from refinery to market.

Crude Lines

There will be about 1000 miles less crude lines constructed in 1954 than in 1953, WORLD OIL estimates. In 1953, crude lines accounted for 4650 miles of the pipe lines constructed in the U. S. Of this amount 3020 miles were crude trunk lines and 1630 miles were gathering systems.

In 1954, estimates indicate that mileage of gathering systems will be about the same. The big drop will be in trunk line mileage. It is estimated that 1500 miles of gathering systems will be constructed and 2200 miles of trunk line during the year.

A number of crude pipe line companies that have led expansion in recent years plan to catch their breath before planning additional line construction. They will devote time to

modernizing old pump stations, ironing wrinkles out of new systems, and improving their expanded organizations.

Meanwhile, companies are making economic studies involving future expansions. This is especially true for the Rocky Mountain and Williston Basin areas.

Many companies with Canadian interests have directed a portion of their engineering forces to studying cold weather pipe line problems, with an eye toward future expansion in this area.

Companies operating in the Gulf Coast area are planning offshore gathering systems when production warrants it.

Pipe Line Sizes

An important trend evident in last year's pipe line expansion is the large diameter of the pipe. There were more miles of 30-inch pipe laid than any other size. Lakehead Pipe Line Company's crude line accounted for 643 miles of the almost 3000 miles of 30-inch. Gas companies laid the rest.

There will likely be a reduction in average size of lines. The reason for this is that products lines are generally smaller than crude lines. So with crude line construction falling off and products lines increasing, the average size will be somewhat smaller.

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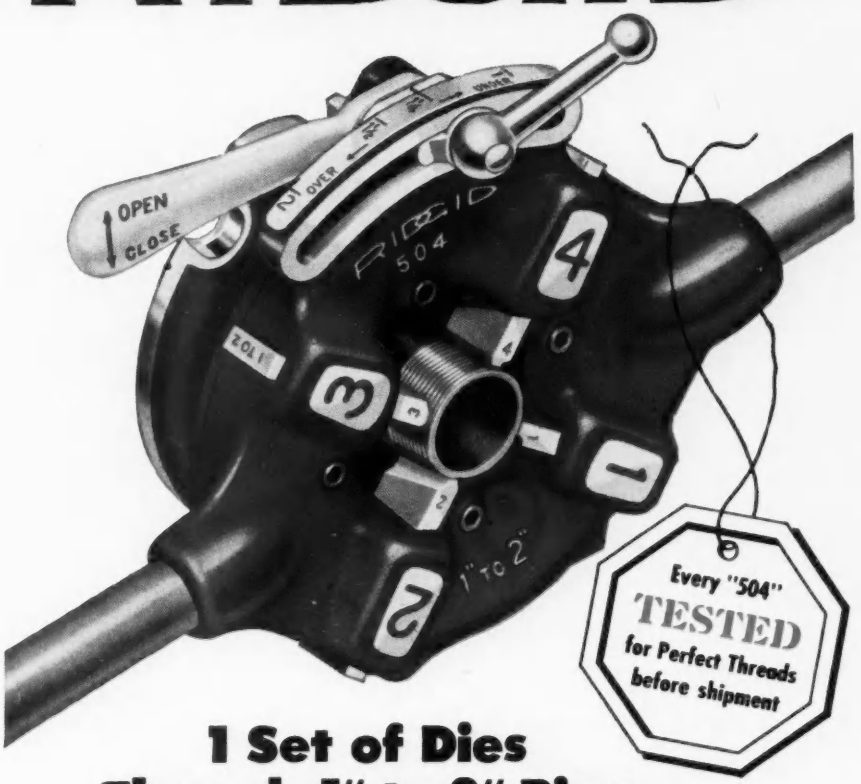

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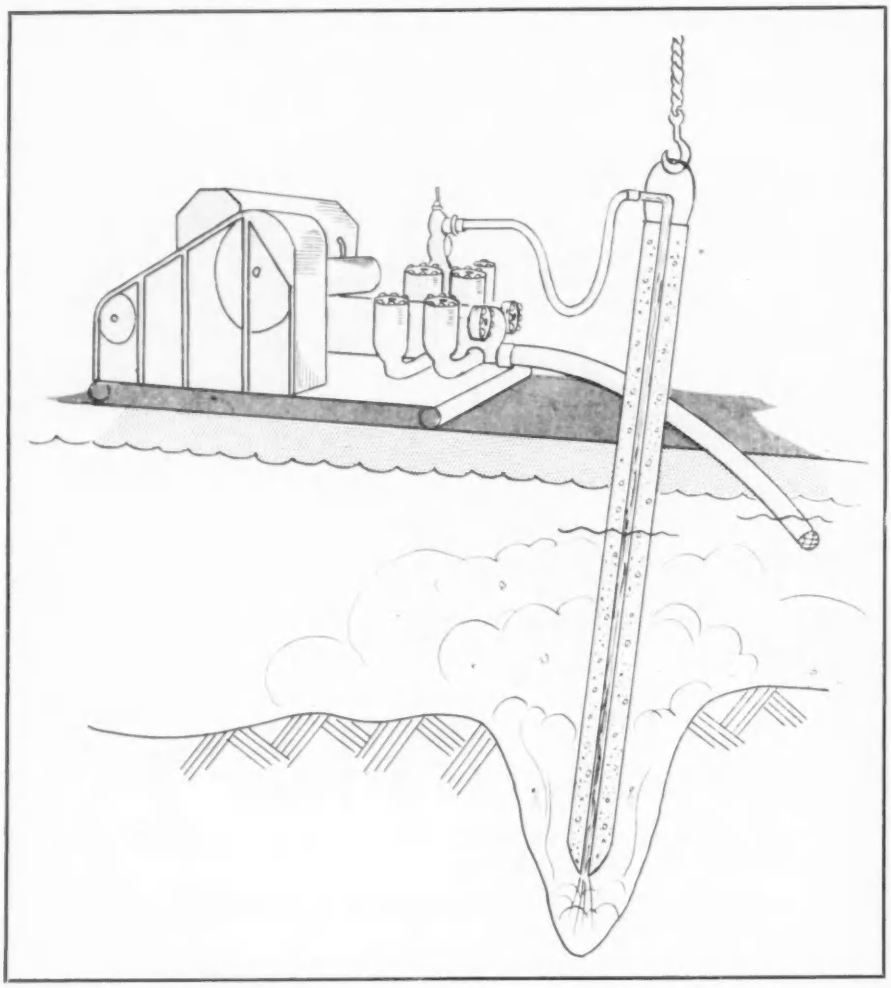
10 BEST PIPE LINE HINTS

. . . published in 1953

The panel of judges which selected the 10 best pipe line hints of the year represented a cross section of the pipe line industry. Included in the group were a vice president of a pipe line company, two engineers, a superintendent of compressor stations, a master mechanic, a division superintendent and a district superintendent.



Pump Jets Piling for Stream Crossings

Using a conventional mud pump, it is possible to jet piling to proper depth in a fraction of the time it would take to drive it. This system provides an easy means of making pile clusters for supporting small river and creek spans. At the same time it saves money that would be spent in moving pile-driving equipment into difficult right-of-way locations.

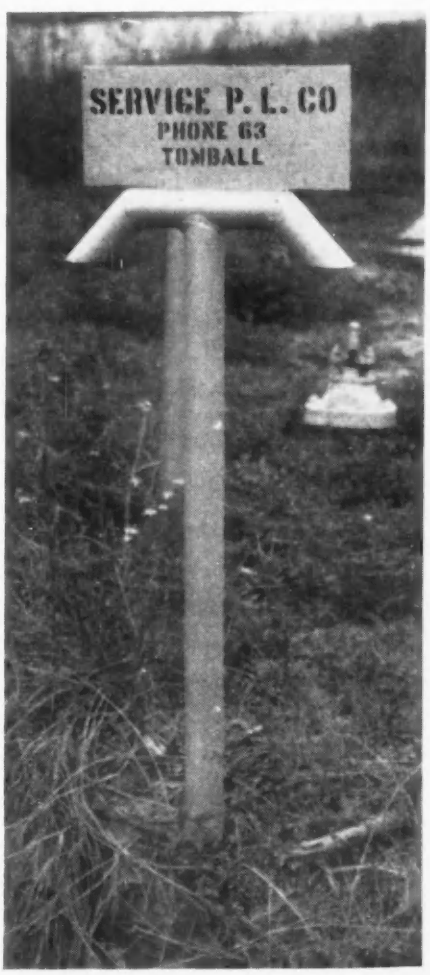
As shown in the drawing, the piles are made of pipe filled with concrete which surrounds 1½-inch jet line in the center. This line ells at the top to connect with the high pressure reciprocating pumps. The lower end of the pipe is bull plugged and welded to the 1½-inch jet line.

A bale at the top of the pipe provides a means of supporting the piling while it is being jetted down to proper depth. As a rule, it will be possible to jet the piling down in a few minutes time; then once the pump is stopped, the earth will quickly close around the pipe, giving it proper bearing capacity.

Road Casing Vent Is Good Spot for Sign Board

Tack-weld a steel plate to the top of a road casing vent and list the emergency phone number or other information you may want to make available to passersby.

You couldn't pick a better location. The vents are located at road crossings and their very presence advises the casual observer that a pipe line is underfoot. By listing the name of the company and an emergency number to be called in case of trouble, you can turn passersby into line walkers for your company.



PIPE LINE PROGRESS

30-inch A.O.Smith line pipe being cradled into position in a New Mexico spread of El Paso Natural Gas Company project.

New El Paso Natural Gas line absorbs more than 300 MILES OF 30-INCH A. O. SMITH LINE PIPE

Essential additional gas volume for California, Arizona, New Mexico and west Texas is now being provided through construction of new pipe line facilities by El Paso Natural Gas Company.

More than 300 miles of high-strength, 30-inch, thin-wall, internally expanded line pipe were furnished by us for this project which was completed in January, 1954.

El Paso Natural Gas Company's new line will carry gas from the Permian Basin of southeastern New Mexico and west Texas, and from the San Juan Basin of northwestern New Mexico and southwestern Colorado across New Mexico and Arizona to the Colorado River on the California border.

The 30-inch pipe line was started during July, 1953, and will be put into service the first part of 1954 . . . another pipe line conquest of rough terrain, desert, mountains and canyons.

A. O. Smith Line Pipe is available in a complete range of sizes and wall thicknesses, from 8⅝-in. to 36-in. diameters.

The A.O. Smith Casing Mill is operating at capacity to supply vitally needed casing for the Oil and Gas Industry.

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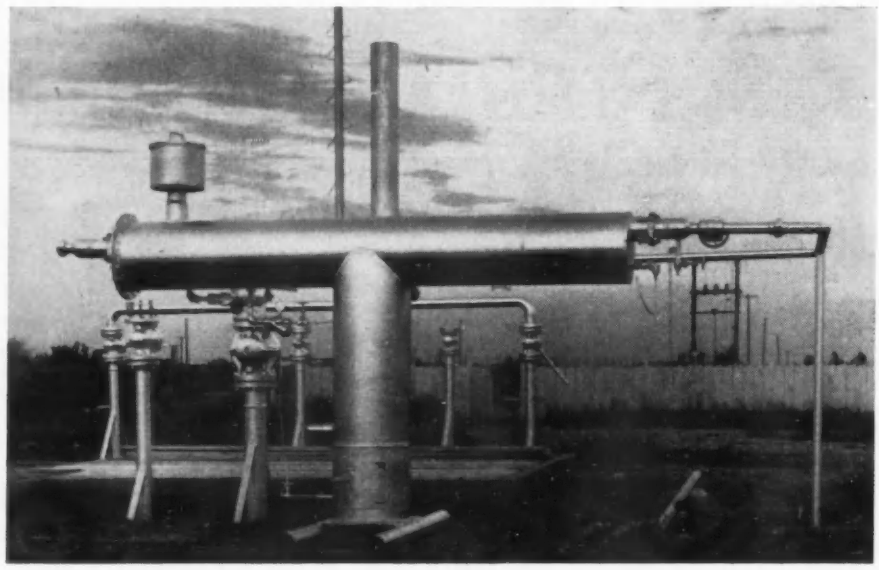
Paper Cup Slogans Make Workers Safety Minded

Drive home safety slogans by printing them on paper cups used by employes. This is inexpensive and perhaps more effective than conventional safety posters. It will be especially effective on construction jobs in summertime when water consumption is at its peak. The paper cup device is also a good way to put over other campaign slogans to employes.



Freezer Prevents Wet Gas Line Freeze-up

Here's a heater made mostly out of scrap materials that prevents freeze-up of a wet gas line entering a compressor and dehydration station during cold winter months.

Gas flows through the heater from left to right. Note that diameter of the flow line has been increased in order to achieve lower velocity and more heat exchanged area inside the heater. The line passes through a water or oil bath which transfers the heat from flame to gas.

Fuel for the pilot flame and burner is taken from the warmed downstream side of the heater at left, piped back through the heating fluid and then into regulator at right.

Cradle Attachment Aids Pipe Handling

Here is an attachment you can make in your welding shop that will simplify pipe and steel shaft handling. The device is a cradle which slips on and off the shoe of the truck with ease, yet holds the lengths of pipe or shaft in place while a man pushes the truck.

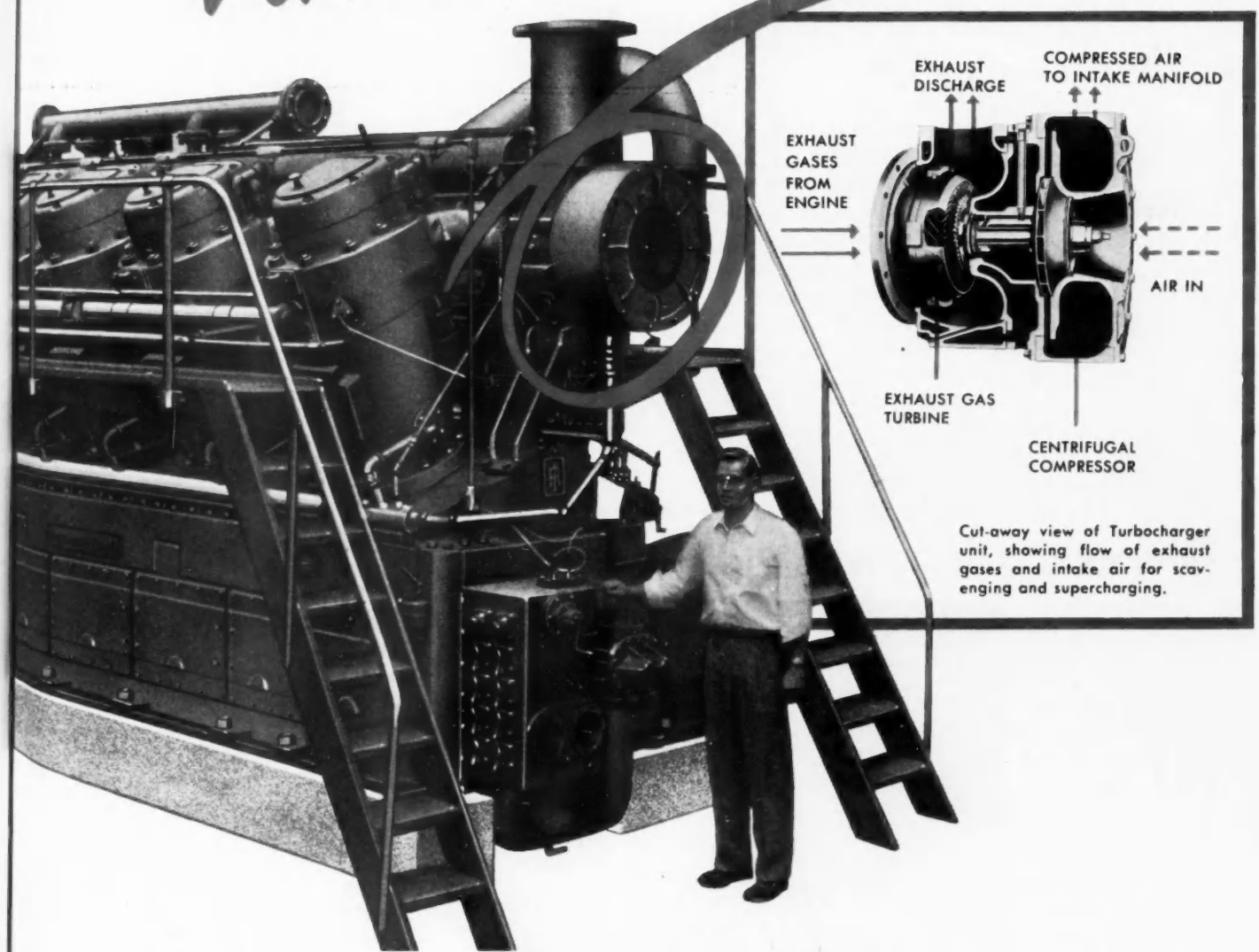
Nothing is harder than trying to balance a bar or heavy length of pipe on a hand truck. Usually a man has to walk alongside the truck and hold the piece in place. Not so with the device pictured. One man can flop the shaft or pipe over onto the truck and the self-aligning cradle lets it fall between the handles. Then one man can easily push the truck using both hands on the handles.

To make this handy attachment, weld two 4 by 10 pieces of three-eighths-inch steel plate together in such a way as to form a 90 degree angle. Then bolt a piece of hard rubber or truck tire inside the Vee you have formed and the cradle part of the attachment is complete.

Weld a piece of extra heavy one-inch pipe behind the Vee to form a hinge. Then fit the inside of the pipe with a snug pin and weld the pin to the wedge that holds the cradle to the truck. This wedge is made by welding two pieces of steel together, leaving a gap wide enough to fit onto the truck shoe. Thus, the attachment can be slipped onto the warehouse truck when it is needed, and removed just as quickly when you have finished using it.

gas-engine-driven compressor

IT'S TURBOCHARGED



Cut-away view of Turbocharger unit, showing flow of exhaust gases and intake air for scavenging and supercharging.

In the new TURBOCHARGED "KVS" engine, waste energy from the exhaust provides power for scavenging and supercharging, through two gas-turbine-driven centrifugal blowers, one at each end of the machine. The result—a new high in efficiency and economy! Savings in space, weight, fuel and cooling equipment make this an important advance in the design of Ingersoll-Rand's traditionally dependable V-angle, 4-cycle gas engine. Ask your I-R representative for the complete story.

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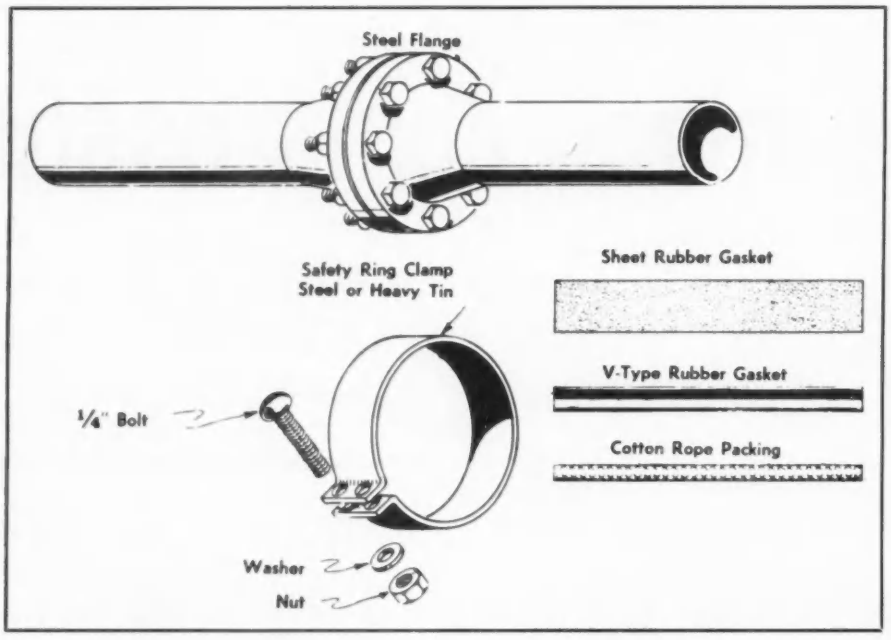
COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES



Safety Spray Ring Controls Oil Spray

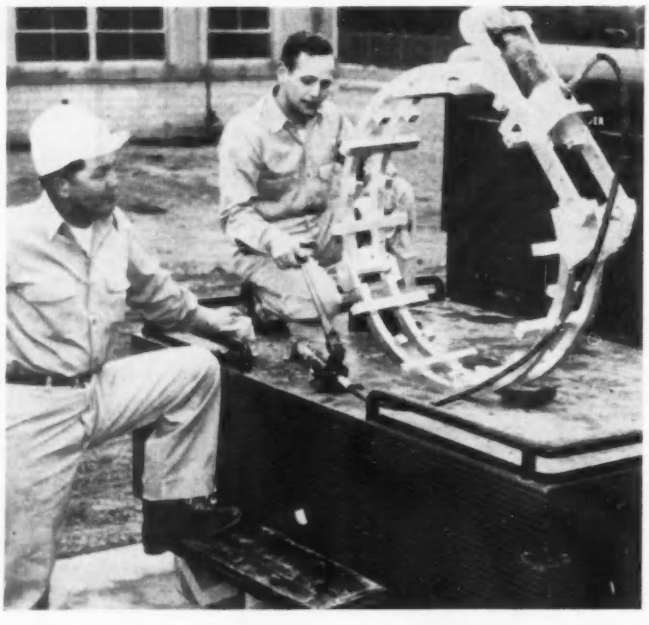
Wrap a light gauge metal ring around a flange and control the high pressure oil spray that comes when gaskets blow out or leak. This may prevent serious injury to operators and station fire as well by directing the knifelike spray downward into sump troughs, keeping it off the hot engines that could ignite it.

It's simple to make the ring. Cut a strip of light gauge metal long enough to wrap around the flanges and at the same time provide room for the bolts at bottom.

Then install V-belting between the flanges leaving a gap of 1½ inches at bottom. Bolt the metal ring around the flanges lining up its gap at bottom. Thus any spray will be directed downward. If there is insufficient space between flanges for belting, use rubber wrapping or rope packing.

Hydraulic Clamp Aligns Big-Inch Casing

Make a line-up clamp for big-inch casing right in the shop. That's what men at Tennessee Gas Transmission Company's Compressor Station at Carrollton, Ohio, did. They replaced the lever on an ordinary external line up clamp with a hydraulic piston and came up with a clamp that will put a terrific squeeze on casings to line them up while the welder is making his tack welds.

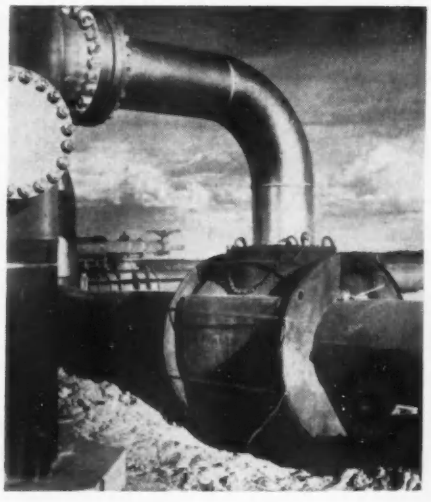


Welder O. L. Stevenson and Utilityman W. E. Dehart, members of the crew that devised and fabricated the clamps, are shown in the photo.

Note the small high pressure tubing that is attached to the piston and to the hydraulic pump. A small needle valve on the pump enables workmen to hold the pipe in place while the welds are being made. The carriage for the hydraulic piston can be made in such a way that the piston can be used of different size clamps.

Working in conjunction with the time clock which trips off the diesel, it changes fuel 30 minutes before the actual shutdown occurs. A 110-volt current energizes the solenoid, the core of which raises a lever to operate the three-way valve which changes the fuel.

Actually, the device is needed only during the two or three winter months when danger of freezing occurs. The rest of the time the diesels can run to the shutoff on crude oil fuel. Restarting offers little difficulty.



Furnace Relieves Welding Stresses

A brick-lined furnace which can clamp around headers and piping of different shapes, is proving useful in relieving the welding stresses in station piping. Ordinarily the stresses in heavy wall pipe are more intense than those in thin wall pipe. The reason lies in the fact that the heavy pipe requires more welding passes, and each pass of the electric arc weld contracts from the intense heat of welding individually. For example, on a ¾-inch piece of pipe, the stringer bead pass is usually cool by the time the lace pass is applied.

Reheating the entire weld overcomes this problem and makes the entire weld stronger than before.

Performing this operation is especially critical where the welds tie a rigidly fixed header to a rigid vessel as shown in the photo. Structural welds can build up at the tie-in and

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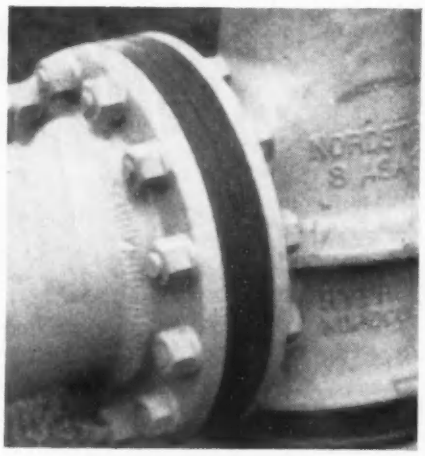
weld stresses could become additive.

Here is one way to solve the problem. A brick-lined furnace which splits in half can be clamped around the weld and gas burners can bring the temperature to the 1100° to 1500° F. specified by ASA. The bricks inside the furnace hold the temperature at high level long enough for the plastic flow to take place.

A thermocouple inside the furnace enables the operator to control the temperature inside the furnace.

Plastic Tape Seals Gap Between Flanges



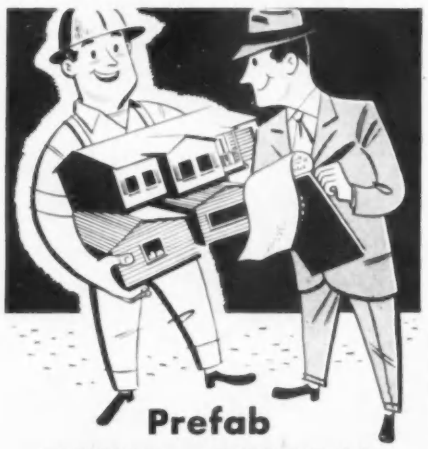
Plastic tape can be used to seal off the gap between mated flanges to protect exposed studs and flange faces from moisture, salt air, industrial gases and dirt to minimize corrosion.

Corrosion was taking a heavy toll in studs and flanges at a gas pipe line terminal located a few miles from a salt water bay. Salt air and corrosive industrial gases attacked the uninsulated studs and flange faces in the space between mated flanges. Because the gap between the flanges was narrow measures to seal off the highly stressed steel studs were ineffective.

A highly satisfactory solution to the problem was devised by engineers at the terminal. They applied polyethylene plastic tape over the gap between mated flanges. This tape has high electrical resistance and excellent sealing properties.

The tape was applied after the studs and flange faces were coated with corrosion inhibitor. A band of tape was wound around the pairs of flanges, overlapped to seal off the interior. Since the tape adheres to the metal surfaces of the flange, air and the impurities it carries cannot enter the space between the flanges.

This method of corrosion control has proved successful and is now being used on plug valves, meter runs and other flanged installations at the terminal.



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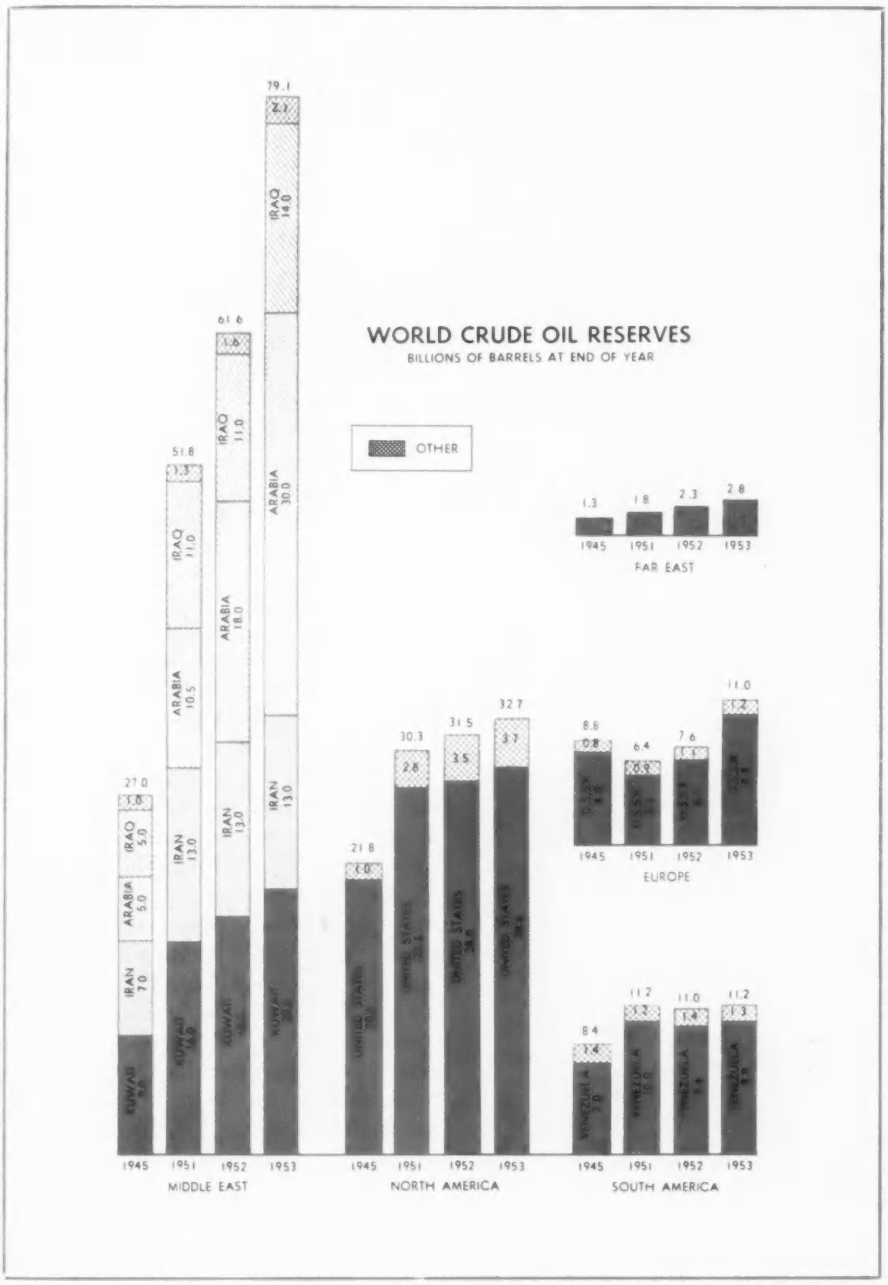
Dollies on Sled Aid Pipe Fabrication

Rubber-clad dollies mounted on pipe sled can speed and improve the utility welding on line and big-inch welding in station yard. At the same time, it provides a safe way to handle pipe without the clumsy skids ordinarily used to hold pipe in place while it is being fabricated.

To make the device, weld or bolt two pairs of dollies onto a sled made of six-inch scrap pipe. Mitre the runners and cover them with light steel plate, so the sled will not dig in when it is being pulled. The resulting skid can be moved easily about the job with a light winch truck.



World Crude Reserves . . . Estimated by WORLD OIL to be 136,877,482,000 barrels.

WORLD RESERVES of crude oil are at a new all time peak. They are estimated at 136,877,482,000 barrels as of the end of 1953. This estimate was made by WORLD OIL, with benefit of advice from various well qualified sources.

The estimate is about 22 billion barrels greater than that of 115,177,701,000 barrels offered a year ago for the end of 1952. This net increase occurred in spite of the using up of 4¾ billion barrels from reserves during 1953.

The large increase in the estimate reflected some major discoveries of new fields, some large upward revisions of previous estimates in the light of additional developments, and in some cases the availability of better information than previously for making estimates.

Middle East. While the world total of estimated reserves showed a sharp increase, the gain was not worldwide in scope but limited largely to the oil-rich Middle East, where estimates for the different countries commonly are made in billions of barrels rather than in the millions required for nearly all other countries.

The new estimate for the Middle East as a whole is 79,075,000,000 barrels, or practically 60 percent of the world total. This estimate is 17.5 billion barrels above that of 61,570,000,000 offered for the end of 1952. Two thirds of this increase resulted from raising the estimate for Saudi Arabia by 12 billion barrels—to 30 billion barrels from 18 billion. Kuwait's estimate was raised 2 billion barrels, to 20 billion for the end of 1953 from 18 billion at end of 1952. Iraq was increased 3 billion barrels, to 14 billion from 11 billion. Each of these three countries had important discoveries, field extensions, or other proving up of additional reserves, and a part of the large gain for Saudi Arabia is explained by the fact that the year-ago estimate of 18 billion barrels was soon thereafter indicated to have been actually too low by about 4 billion barrels; 22 billion would have been justified at that time.

Qatar is now estimated at 1½ billion barrels, having been revised upward from 1¼ billion a year ago, and Bahrain has been lowered to 250 million from 300. The Neutral Zone between Saudi Arabia and Kuwait has entered the picture since a year ago, and is here credited with 300 million barrels of reserves, although some sources say that based on characteristics of the producing formation involved, the estimate should be 500 to 600 million.

Revisions. Aside from the large increase in the Middle East, the most important change in world reserves from a year ago to now is a revision rather than an actual increase. It is the use of an estimate of 9.8 billion barrels for the U. S. S. R. (Russia) as of the end of 1953 instead of the figure of 6.5 billion shown for the end of 1952. The higher estimate has been used here because various sources have insisted that a figure of this order is justified; although it can be logically questioned from the standpoint that it is equivalent to 27.6 times the estimated Russian produc-

tion of only 355 million barrels in 1953. This is a questionably high ratio of reserves to production.

Outside Russia, about the only noteworthy changes in proved reserves in Europe in 1953 were moderate increases achieved through development in Germany and the Netherlands.

Far East. In the Far East, reserves are now estimated at about 2¾ billion barrels, an increase of about ½ billion since a year ago, due to the rise of Indonesia to 1.9 from 1.4 billion barrels.

The whole Western Hemisphere shows only a nominal increase in reserves since a year ago, based largely on gains in the U. S. and Venezuela. U. S. crude reserves are now up to about 29 billion barrels, or 1 billion more than a year ago as estimated by the American Petroleum Institute. Venezuela's present estimated reserves of 9.9 billion are 300 million larger than a year ago.

The estimate of 30 billion barrels now for Saudi Arabia makes that country No. 1 in the world, slightly surpassing the U. S., which was consistently the leader, far out in front, in the past. A major discovery in 1953 was importantly responsible for the sharp increase in Saudi Arabia's estimated reserves. Arabian American Oil Company made a discovery in early December with its Huiya 1 wildcat about 15 miles south of the established limit of the Uthmaniyah area of the Ghawar field and about midway between Uthmaniyah and the 1949-discovered Ain Haradh field. It indicates the possibility of oil in the whole area of 30 miles separating those two fields. The well is officially classed by the company as a stepout to the Ghawar field, which development drilling in 1953 proved up considerably; the extension making this undoubtedly the largest reservoir of oil in the world.

The estimate here of 20 billion barrels of reserves for Kuwait is believed to be well justified. Some sources rate the country at 22 to 25 billion barrels.

Iraq's reserve estimate has been raised to 14 billion barrels from 11 billion a year ago on the basis of at least one excellent discovery and further development drilling in 1953. Basrah Petroleum Company discovered a field at Rumaila, 20 miles west of the Zubair field. Oil sands were encountered at 10,000 feet in the same formation as that producing at Zubair.

There is also a new discovery by Iraq Petroleum Company on the Trucial Coast at Murban in the shiekdom of Abu Dhabi.

Iran's reserves are estimated again, as a year ago, at 13 billion barrels, as there has been no further development. However, some sources rate Iran at 15 billion barrels or higher.

World Crude Reserves at End of 1953

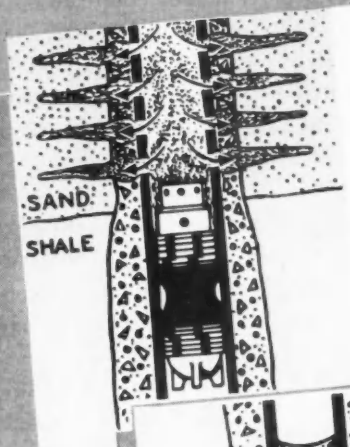
Crude oil only; not including natural gas liquids. Reserves estimated by WORLD OIL with aid of oil companies and other sources. Production partly from U. S. Bureau of Mines and remainder from other sources or estimated.

THOUSANDS OF BARRELS

Continent and Country	Reserves, End 1953		Production, 1953		Ratio Reserves to Prod.
	Thous. Barrels	% of World	Thous. Barrels	% of World	
North America	**32,708,982**	**23.89**	**2,509,805**	**53.03**	**13.0**
Alaska	500	0.00	.....	.....	.....
Canada	2,300,000	1.68	80,922	1.70	28.4
Cuba	1,500	0.00	36	0.01	41.7
Mexico	1,400,000	1.02	71,366	1.50	19.6
United States	29,006,982	21.19	2,357,481	49.82	12.3
South America	**11,196,000**	**8.18**	**748,476**	**15.81**	**15.0**
Argentina	275,000	0.20	28,014	0.59	9.8
Bolivia	10,000	0.01	512	0.01	19.5
Brazil	40,000	0.03	992	0.02	40.3
Chile	40,000	0.03	1,109	0.03	36.1
Colombia	400,000	0.29	39,438	0.83	10.1
Ecuador	26,000	0.02	2,908	0.06	8.9
Peru	225,000	0.16	16,294	0.34	13.8
Trinidad	280,000	0.21	22,145	0.47	12.6
Venezuela	9,900,000	7.23	637,064	13.46	15.5
Europe	**10,991,000**	**8.03**	**441,057**	**9.32**	**24.9**
Albania	20,000	0.02	1,000	0.02	20.0
Austria	200,000	0.14	20,500	0.43	9.8
Czechoslovakia	7,000	0.01	750	0.02	9.3
France	35,000	0.02	2,510	0.05	13.9
Germany, West	350,000	0.26	15,397	0.33	22.7
Great Britain	4,000	0.00	396	0.01	10.1
Hungary	40,000	0.03	3,350	0.07	11.9
Italy	5,000	0.00	675	0.01	7.4
Netherlands	100,000	0.08	5,579	0.12	17.9
Poland	20,000	0.01	1,750	0.04	11.4
Roumania	400,000	0.29	33,100	0.70	12.1
U. S. S. R. (Russia)	9,800,000	7.16	355,000	7.50	27.6
Yugoslavia	10,000	0.01	1,050	0.02	9.5
Africa	**142,000**	**0.11**	**18,216**	**0.39**	**7.8**
Algeria	4,000	0.00	642	0.01	6.2
Egypt	130,000	0.10	16,821	0.36	7.7
Morocco, French	8,000	0.01	753	0.02	10.6
Asia, Total	**81,838,500**	**59.79**	**1,014,954**	**21.45**	**80.6**
Asia, Middle East	**79,075,000**	**57.78**	**887,412**	**18.75**	**89.1**
Bahrain	250,000	0.19	10,979	0.23	22.8
Iran (Persia)	13,000,000	9.49	9,890	0.21	1,314.5
Iraq	14,000,000	10.23	210,298	4.44	66.5
Kuwait	20,000,000	14.61	315,246	6.66	63.4
Neutral Zone	300,000	0.22	.....	.....	.....
Qatar	1,500,000	1.10	32,527	0.69	46.1
Saudi Arabia	30,000,000	21.92	308,294	6.51	97.3
Turkey	25,000	0.02	178	0.01	140.0
Asia, Far East	**2,763,500**	**2.01**	**127,542**	**2.70**	**21.7**
Burma	45,000	0.03	776	0.02	58.0
India	46,000	0.03	1,975	0.04	23.3
Pakistan	22,000	0.02	2,050	0.04	10.7
China	25,000	0.02	730	0.02	34.2
Indonesia	1,900,000	1.38	74,316	1.57	25.6
Japan	60,000	0.05	2,107	0.04	28.5
New Guinea	100,000	0.07	1,791	0.04	55.8
Sakhalin	65,000	0.05	7,000	0.15	9.3
Sarawak-Brunei (Br. Borneo)	500,000	0.36	36,773	0.78	13.6
Taiwan (Formosa)	500	0.00	24	0.00	20.8
Australia-New Zealand	**1,000**	**0.00**	**2**	**0.00**	.....
TOTAL, WORLD	**136,877,482**	**100.00**	**4,732,510**	**100.00**	**28.9**

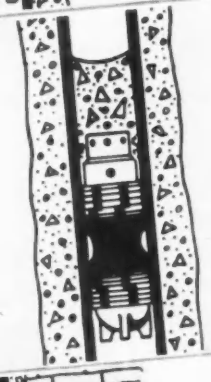
A few more ways in which operators profit with

Drillable Wireline Bridging Plugs



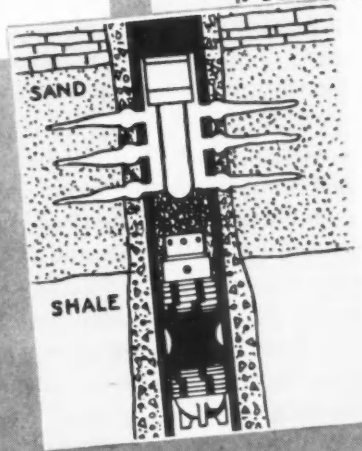
SQUEEZE OPERATIONS

Any operation requiring the application under pressure of cement, plastic or other types of materials can be done more efficiently using this bridging plug. It is quickly set and quickly drilled out. It is particularly useful where test perforations are being squeezed with cement or plastic during the testing of several zones in the same well.



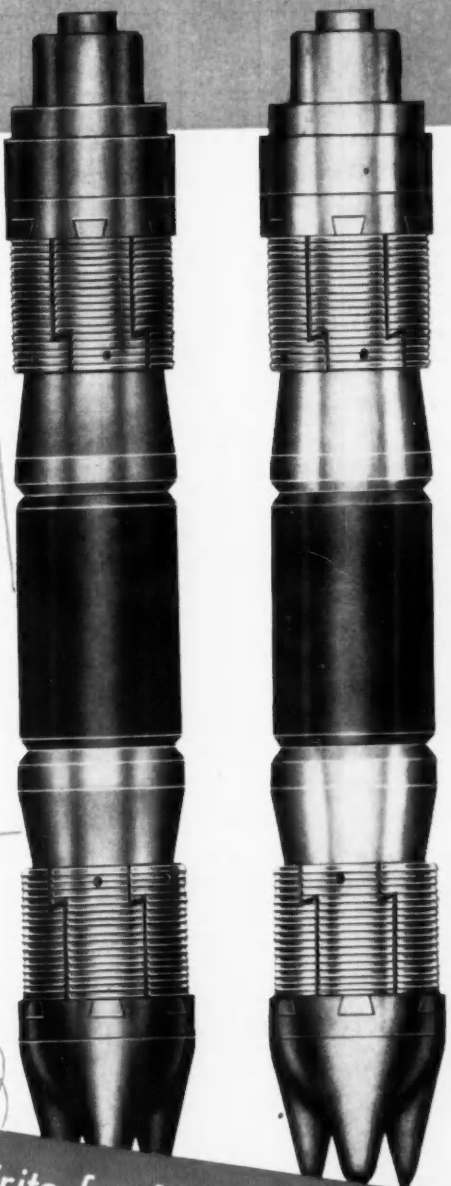
ABANDONMENT

Lane-Wells Drillable Bridging Plugs provide pressure-tight plug which will outlast the casing for permanent abandonment. If required, a light cement cap may be added to the plug. The result is a quickly-placed, completely permanent plug job in the well. Plugs are often used to plug off each zone when upper zones are produced and abandoned successively.



FALSE BOTTOM

Lane-Wells Drillable Bridging Plugs are used to plug off a lower formation and provide a bottom on which to anchor the tubing in setting an anchor type packer. The plug, which is usually covered with a light cement or gravel cap, will provide a stable, rigid bottom which may be left for permanent abandonment if desired.



And here's WHY ... Lane-Wells Bridging Plugs with greater clearance run in *fast*, on wireline—self-sealing elements give leakproof packoff under differential pressures as high as 10,000 p.s.i.—yet because of cast iron or magnesium construction drill out easily and quickly, with either rotary or cable tools.

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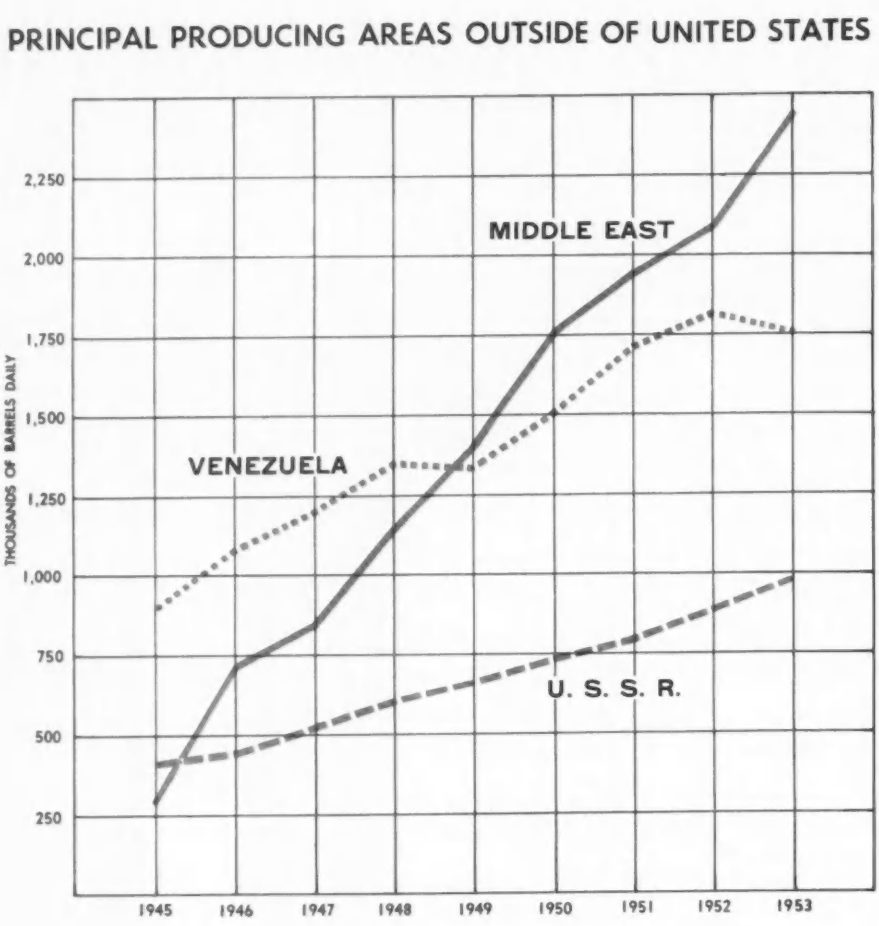


World Crude Production . . .

5 percent increase to push output to nearly 5 billion barrels.

WORLD PRODUCTION of crude oil will further increase by more than 600,000 barrels daily or nearly 5 percent in 1954 and thereby set a new all time record. That's WORLD OIL's forecast. This estimate would put the world output up almost to 5 billion barrels for the year and above 13.5 million barrels per day on the average.

This 5 billion barrels of oil to be produced in 1954 is equivalent to one half the proved reserves of either Venezuela or Russia, or one third those of Texas. It exceeds the reserves of California and Kansas combined, or Oklahoma and Louisiana together. This year's output of about 5 billion barrels will compare with cumulative production so far of about 6.5 billion in the Middle East, 7.5 billion each in Venezuela or Russia, 7 billion in Oklahoma, 3.3 billion in Louisiana, 2.5 billion in Kansas.

More exactly, it is forecast that world production of crude will total about 4,958,000,000 barrels in 1954, an average of 13,583,000 daily. That would be 617,000 barrels per day or 4.8 percent more than the production in 1953.

The estimate includes 2,393,000,000 barrels in the U. S., as forecast by the U. S. Bureau of Mines, and 2,565,000,000 for other countries, a WORLD OIL projection of recent trends. For the U. S. this would be 6,556,000 barrels daily, an increase of 97,000 barrels or 1.5 percent. For countries outside the U. S. it would be 7,027,000 barrels daily, an increase of 520,000 barrels or 8.0 percent—the same percentage as the gains made in 1953 and 1952.

New record set. In 1953 world production totaled about 4,732,510,000 barrels, setting a new record. It averaged 12,966,000 barrels daily, an increase of 682,000 barrels or 5.6 percent over 1952. U. S. production of 2,357,481,000 barrels, or 6,459,000 daily, showed an increase of 203,000 barrels daily or 3.2 percent over 1952. Meanwhile, for the first time in many years, production outside the U. S. exceeded that in the U. S. It totaled 2,375,029,000 barrels and averaged 6,507,000 daily. That was 480,000 barrels a day or 8.0 percent more than in 1952.

World crude production has almost doubled since the end of World War II, and now either the U. S. or the remainder of the world is almost equaling early postwar output of the whole world.

However, production abroad has increased more sharply than in the U. S., with benefit of rich reserves developed in the Middle East and elsewhere.

After averaging 7,109,000 barrels daily in 1945, world production has increased by an average of about 700,000 barrels daily per year. The increases have averaged about 7.5 percent annually. The world output increased as follows: 413,000 barrels daily or 5.8 percent in 1946, 758,000 barrels or 10.1 percent in 1947, 1,100 barrels or 13.3 percent in 1948; then dropped 54,000 daily or 0.6 percent in 1949; thereafter again increased by 1,093,000 barrels daily or 11.7 percent in 1950, by 1,325,000 barrels or 12.7 percent in 1951, 540,000 daily or

4.6 percent in 1952, 682,000 daily or 5.6 percent in 1953; and now promises to increase 617,000 barrels daily or 4.8 percent in 1954.

U. S. crude production has increased in every postwar year except 1949, but all the increases except in 1951 were smaller than for the other countries combined. On the average the output has increased about 200,000 barrels daily or 4 percent pear year. From 4,695,000 barrels daily in 1945, U. S. production rose 56,000 barrels daily or 1.2 percent in 1946, 337,000 daily or 7.1 percent in 1947, 432,000 barrels or 8.5 percent in 1948; dropped 474,000 daily or 8.6 percent in 1949; again rose in 1950 by 361,000 barrels daily or 7.2 percent; jumped by 751,000 barrels daily or 13.9 percent in 1951; gained 98,000 daily or 1.6 percent in 1952; rose 203,000 barrels a day or 3.2 percent in 1953; and is expected to increase 97,000 barrels daily or 1.5 percent in 1954.

In countries outside the U. S., crude production averaged only 2,414,000 barrels daily in 1945, having shown no material increase during World War II. However, the rich potentialities of the Middle East were already recognized, and when the war ended, development abroad proceeded rapidly, and crude production was increased phenomenally. It doubled within five years and at the end of another five years in 1955 will be three times the 1945 output. The production abroad has increased since 1945 by an average of about 500,000 barrels daily or 13 percent per year. The gains were around 700,000 barrels daily or 20 percent in 1948 and 1950.

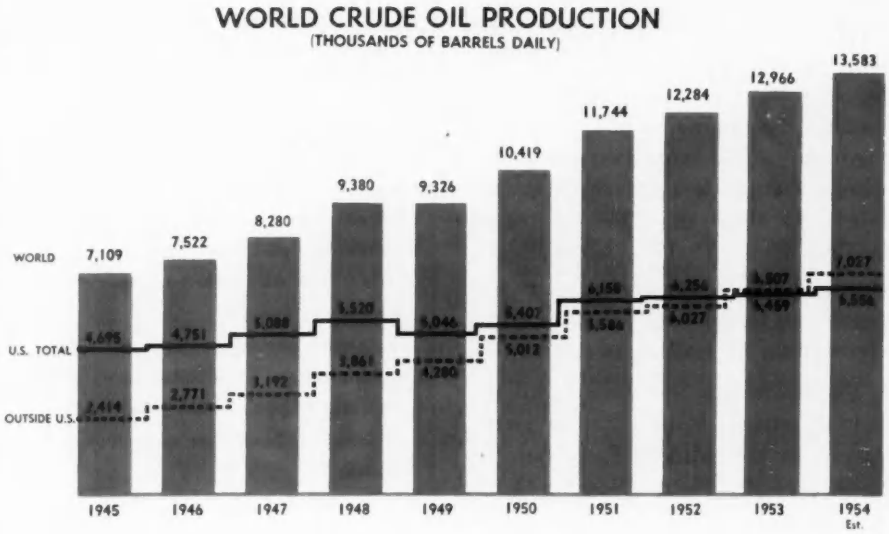
From the 2,414,000 barrels daily in 1945, production outside the U. S. rose 357,000 barrels daily or 14.8 percent in 1946, 421,000 barrels a day or 15.2 percent in 1947, 669,000 daily or 21.0 percent in 1948, 419,000 daily or 10.9 percent in 1949, 732,000 barrels or 17.1 percent in 1950, 574,000 barrels or 11.5 percent in 1951, 441,000 daily or 7.9 percent in 1952, 480,000 barrels daily or 8.0 percent in 1953, and (forecast) 520,000 daily or 8.0 percent in 1954.

The cause. The remarkable expansion of petroleum production outside the U. S. since World War II has resulted from a rare combination of factors on both the demand and supply sides of the petroleum industry economy. On the demand side was the great need for work, power, and fuel for reconstruction and expansion of production of civilian goods. The thirst for oil was great throughout the world, and especially so in Europe. In the U. S. the use of oil increased sharply, and absorbed substantial supplies from foreign as well as domestic fields.

On the supply side of the equation, conditions were ideal for developing production to meet the vast potential demand. In the Middle East, the Far East, the Caribbean area, and elsewhere, were vast known or indicated crude reserves crying for development and markets. All that was needed to develop them was time—the time to get enough materials and to do enough work. With the war over, it was possible to concentrate work on this development, and the work promptly and rapidly proceeded.

Each year brought remarkable development of fields, pipe line systems, and refining facilities. Along with the development of the incredibly rich fields of Saudi Arabia, Kuwait, Iraq, Iran, and other areas adjacent to the Persian Gulf went construction of huge pipe lines across the deserts of the Middle East and an unprecedented refinery construction program in Western Europe. The Middle East reserves and the European market had been "made for each other."

Significant new reserves were developed also in other parts of the world. Noteworthy was the establishment of "big time" production and new reserves in Western Canada, as several major strikes indicated good possibilities for additional important



Crude Oil Production of World, U. S., and Countries Outside U. S., by Years

(Source: U. S. Bureau of Mines except part of 1953 and forecast for 1954 outside U. S. estimated by WORLD OIL.)

THOUSANDS OF BARRELS

Year	WORLD Total	WORLD Daily	U.S. Total	U.S. Daily	OUTSIDE U.S. Total	OUTSIDE U.S. Daily
1918	503,515	1,378	355,928	975	147,587	403
1919	555,875	1,523	378,367	1,037	177,508	486
1920	688,884	1,887	442,929	1,213	245,955	674
1921	766,002	2,098	472,183	1,294	293,819	804
1922	858,898	2,353	557,531	1,528	301,367	825
1923	1,015,736	2,783	732,407	2,007	283,329	776
1294	1,014,318	2,779	713,940	1,956	300,378	823
1925	1,068,933	2,928	763,743	2,092	305,190	836
1926	1,096,823	3,005	770,874	2,112	325,949	893
1927	1,262,582	3,459	901,129	2,469	361,453	990
1928	1,324,774	3,629	901,474	2,469	423,300	1,160
1929	1,485,867	4,071	1,007,323	2,760	478,544	1,311
1930	1,410,037	3,863	898,011	2,460	512,626	1,403
1931	1,372,532	3,760	851,081	2,332	521,451	1,428
1932	1,309,677	3,588	785,159	2,151	524,518	1,437
1933	1,422,146	3,951	905,656	2,481	536,490	1,470
1934	1,522,281	4,170	908,065	2,488	614,216	1,682
1935	1,654,488	4,532	996,596	2,730	657,892	1,802
1936	1,791,540	4,908	1,099,687	3,013	691,853	1,895
1937	2,039,231	5,587	1,279,160	3,505	760,071	2,082
1938	1,988,041	5,446	1,214,355	3,327	773,686	2,119
1939	2,086,160	5,716	1,264,962	3,466	821,198	2,250
1940	2,149,821	5,874	1,353,214	3,697	796,607	2,177
1941	2,220,657	6,084	1,402,228	3,842	818,429	2,242
1942	2,093,100	5,735	1,386,645	3,799	706,455	1,935
1943	2,256,637	6,183	1,505,613	4,125	751,034	2,058
1944	2,592,289	7,083	1,677,904	4,584	914,385	2,498
1945	2,594,697	7,109	1,173,665	4,695	881,042	2,414
1946	2,745,430	7,522	1,733,939	4,751	1,011,491	2,771
1947	3,022,139	8,280	1,856,987	5,088	1,165,152	3,192
1948	3,433,234	9,380	2,020,185	5,520	1,413,049	3,861
1949	3,404,025	9,326	1,841,940	5,046	1,562,085	4,280
1950	3,802,843	10,419	1,973,574	5,407	1,829,269	5,012
1951	4,286,443	11,744	2,247,711	6,158	2,038,732	5,586
1952	4,495,896	12,284	2,289,836	6,256	2,206,060	6,027
1953	4,732,510	12,966	2,357,481	6,459	2,375,029	6,507
1954 Est.	4,958,000	13,583	2,393,000	6,556	2,565,000	7,027

fields throughout a vast region extending from the U. S. border northwesterly through Alberta and Saskatchewan to the Arctic Ocean. Canadian development has proceeded vigorously and successfully, and whereas Canada formerly imported much oil from the Caribbean area and the U. S., is will be self sufficient in oil in the future and even export petroleum to the U. S. Northwest and elsewhere.

Venezuela has lost actual and potential markets in the Eastern Hemisphere to the Middle East, but has gained markets in the Western Hemisphere, stepping up shipments to the U. S. and other countries of North and South America. Venezuela's crude production of 1,745,000 barrels daily in 1953 was a decrease of 59,000 barrels daily or 3.2 percent from the postwar peak of 1,804,000 barrels daily in 1952. But 1953 was the only year since the war that production failed to show an increase. Despite this slight decline, Venezuelan output is twice the 1945 level of 885,000 barrels daily. The country is finding new markets to replace those lost in the Eastern half of the world and in Canada, and a resumption of the rising trend in Venezuelan production is promised.

(SEE TABLES, PAGES 224-226-230.)

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Trends in World Crude Oil Production, by Countries, and Cumulative Production Through 1953

(Sources: U. S. Bureau of Mines except 1953 partly from private sources or estimated by WORLD OIL)

Continent and Country	Annual Production (Thousands of Barrels)		Daily Average Production (Actual Barrels)			Year's Production As Percent of World		Cumulative Production To January 1, 1954 (Thousands of Barrels)	
	1952	1953	1952	1953	% Diff. '52-'53	1952	1953	Total	As % of World
North America	**2,428,250**	**2,509,805**	**6,634,563**	**6,876,178**	**+ 3.6**	**54.01**	**53.03**	**50,906,023**	**64.37**
Canada	61,103	80,922	166,948	221,704	+ 32.8	1.35	1.70	381,119	0.48
Cuba	36	36	98	99	+ 1.0	0.00	0.01	2,481	0.00
Mexico	77,275	71,366	211,134	195,523	— 7.4	1.72	1.50	2,708,307	3.43
United States	2,289,836	2,357,481	6,256,383	6,458,852	+ 3.2	50.94	49.82	47,814,116	60.46
South America	**766,395**	**748,476**	**2,093,975**	**2,050,619**	**— 2.1**	**17.04**	**15.81**	**9,626,349**	**12.18**
Argentina	24,807	28,014	67,779	76,751	+ 13.2	0.55	0.59	535,456	0.68
Barbados	.....	.....	.....	.....	.....	.....	.....	8	0.00
Bolivia	526	512	1,437	1,403	— 2.4	0.01	0.01	7,148	0.01
Brazil	750	992	2,049	2,718	+ 32.7	0.02	0.02	3,412	0.01
Chile	906	1,109	2,475	3,038	+ 22.7	0.02	0.03	3,403	0.00
Columbia	38,652	39,438	105,606	108,049	+ 2.3	0.86	0.83	621,512	0.79
Ecuador	2,839	2,908	7,757	7,967	+ 2.7	0.06	0.06	57,485	0.07
Peru	16,403	16,294	44,817	44,641	— 0.4	0.36	0.34	450,302	0.57
Trinidad	21,258	22,145	58,082	60,671	+ 4.5	0.48	0.47	477,343	0.61
Venezuela	660,254	637,064	1,803,973	1,745,381	— 3.2	14.68	13.46	7,470,280	9.44
Europe	**404,588**	**441,057**	**1,105,432**	**1,208,375**	**+ 9.3**	**9.00**	**9.32**	**9,590,720**	**12.13**
Albania	1,100	1,000	3,005	2,740	— 8.8	0.03	0.02	21,462	0.03
Austria	20,400	20,500	55,738	56,164	+ 0.8	0.45	0.43	124,498	0.16
Czechoslovakia	740	750	2,022	2,055	+ 1.6	0.02	0.02	6,859	0.01
France	2,377	2,510	6,495	6,877	+ 5.9	0.05	0.05	22,235	0.02
Germany	12,435	15,397	33,975	42,183	+ 24.2	0.28	0.33	144,367	0.19
Great Britain	407	396	1,112	1,085	— 2.4	0.01	0.01	5,948	0.00
Hungary	3,500	3,350	9,563	9,178	— 4.0	0.07	0.07	60,114	0.08
Italy	487	675	1,331	1,849	+ 38.9	0.01	0.01	4,851	0.01
Netherlands	4,975	5,579	13,593	15,285	+ 12.4	0.11	0.12	30,117	0.03
Poland	1,700	1,750	4,645	4,794	+ 3.2	0.04	0.04	284,770	0.36
Roumania	33,000	33,100	90,164	90,685	+ 0.6	0.74	0.70	1,354,686	1.72
U. S. S. R. (Russia)	322,400	355,000	880,874	972,603	+ 10.4	7.17	7.50	7,525,148	9.51
Yugoslavia	1,067	1,050	2,915	2,877	— 1.3	0.02	0.02	5,665	0.01
Africa	**17,570**	**18,216**	**48,006**	**49,907**	**+ 4.0**	**0.39**	**0.39**	**206,664**	**0.26**
Algeria	357	642	975	1,759	+ 80.4	0.01	0.01	1,226	0.00
Egypt	16,464	16,821	44,984	46,085	+ 2.4	0.37	0.36	202,471	0.26
Morocco	749	753	2,047	2,063	+ 0.8	0.01	0.02	2,967	0.00
Asia, Total	**879,091**	**1,014,954**	**2,401,888**	**2,780,696**	**+ 15.8**	**19.56**	**21.45**	**8,747,692**	**11.06**
Asia, Middle East	**762,598**	**887,412**	**2,083,601**	**2,431,266**	**+ 16.7**	**16.97**	**18.75**	**6,369,647**	**8.06**
Bahrain	11,004	10,979	30,065	30,079	.....	0.25	0.23	153,893	0.20
Iran	10,100	9,890	27,595	27,096	— 1.8	0.22	0.21	2,533,443	3.20
Iraq	140,799	210,298	384,697	576,159	+ 49.8	3.13	4.44	908,138	1.15
Kuwait	273,433	315,246	747,085	863,688	+ 15.6	6.08	6.66	1,077,967	1.36
Qatar	25,255	32,527	69,003	89,115	+ 29.1	0.57	0.69	88,809	0.11
Saudi Arabia	301,861	308,294	824,757	844,641	+ 2.4	6.71	6.51	1,606,724	2.04
Turkey	146	178	399	488	+ 22.3	0.01	0.01	673	0.00
Asia, Far East	**116,493**	**127,542**	**318,287**	**349,430**	**+ 9.8**	**2.59**	**2.70**	**2,378,045**	**3.00**
Burma	645	776	1,762	2,126	+ 20.7	0.02	0.02		
India	1,900	1,975	5,191	5,411	+ 4.2	0.04	0.04	355,906	0.45
Pakistan	1,580	2,050	4,317	5,616	+ 30.1	0.04	0.04		
China	730	730	1,995	2,000	+ 0.3	0.01	0.02	6,947	0.01
Indonesia	62,495	74,316	170,751	203,606	+ 19.2	1.39	1.57	1,458,300	1.84
Japan	2,100	2,107	5,738	5,773	+ 0.6	0.05	0.04	104,989	0.13
New Guinea	1,725	1,791	4,713	4,907	+ 4.1	0.04	0.04	8,871	0.01
Sakhalin	7,000	7,000	19,126	19,178	+ 0.3	0.15	0.15	115,240	0.15
Sarawak-Brunei (Br. Borneo)	38,300	36,773	104,645	100,748	— 3.7	0.85	0.78	327,421	0.41
Taiwan (Formosa)	18	24	49	65	+ 32.7	.....	.....	371	0.00
Australia-New Zealand	**2**	**2**	**5**	**5**	.....	.....	.....	**70**	**0.00**
World, Undistributed	.....	.....	.....	.....	.....	.....	.....	**1,044**	**0.00**
TOTAL WORLD	**4,495,896**	**4,732,510**	**12,283,869**	**12,965,781**	**+ 5.6**	**100.0**	**100.00**	**79,078,562**	**100.00**

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- Unmatched simplicity in changing rams—simply unbolt two doors, change rams, close and bolt the doors. Rams are automatically aligned as doors are bolted shut!
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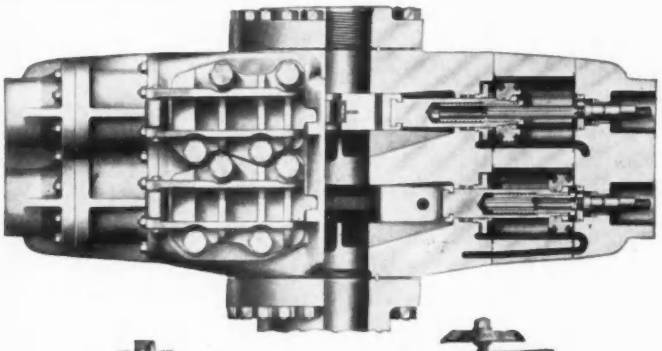

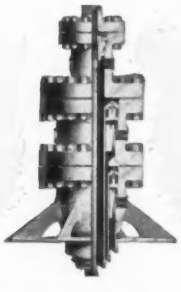

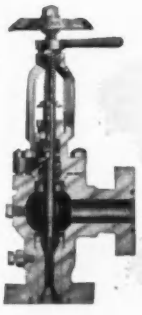

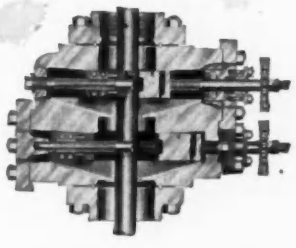

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31 years OF OIL TOOL LEADERSHIP

World Crude Oil Production, By Countries, By Years (Part 1)

(Complete production history of world, in thousands of barrels of 42 U. S. Gallons. Sources: *Mineral Resources and Minerals Yearbook*, except as otherwise indicated.)

World and North America, 1857-1895

YEAR	World Total	Percent Produced by U. S.	Canada	United States	Total North America
1856	....	....	....	....	....
1857	2	....	....	....	....
1858	4	....	....	....	....
1859	6	31	....	2	2
1860	509	98	....	500	500
1861	2,131	99	....	2,114	2,114
1862	3,092	99	12	3,057	3,069
1863	2,763	94	83	2,611	2,694
1864	2,304	92	90	2,116	2,206
1865	2,716	92	110	2,498	2,608
1866	3,899	92	175	3,598	3,773
1867	3,709	90	190	3,347	3,537
1868	3,990	91	200	3,646	3,846
1869	4,696	90	220	4,215	4,435
1870	5,799	91	250	5,261	5,511
1871	5,730	91	270	5,205	5,475
1872	6,877	92	308	6,293	6,601
1873	10,838	91	365	9,894	10,259
1874	11,933	92	169	10,927	11,096
1875	9,977	88	220	8,788	9,008
1876	11,051	83	312	9,133	9,445
1877	15,754	85	312	13,350	13,662
1878	18,417	84	312	15,397	15,709
1879	23,601	84	575	19,914	20,489
1880	30,018	88	350	26,286	26,636
1881	31,993	86	275	27,661	27,936
1882	35,704	85	275	30,350	30,625
1883	30,255	78	250	23,450	23,700
1884	35,969	67	250	24,218	24,468
1885	26,765	59	250	21,859	22,109
1886	47,243	59	584	28,065	28,649
1887	47,807	59	526	28,283	28,809
1888	52,165	53	695	27,612	28,307
1889	61,507	57	705	35,164	35,869
1890	76,633	60	795	45,824	46,619
1891	91,100	60	755	54,293	55,048
1892	88,739	57	780	50,515	51,295
1893	92,038	53	798	48,431	49,229
1894	89,337	55	829	49,344	50,173
1895	103,692	51	726	52,892	53,618

World and North America, 1896 to Now

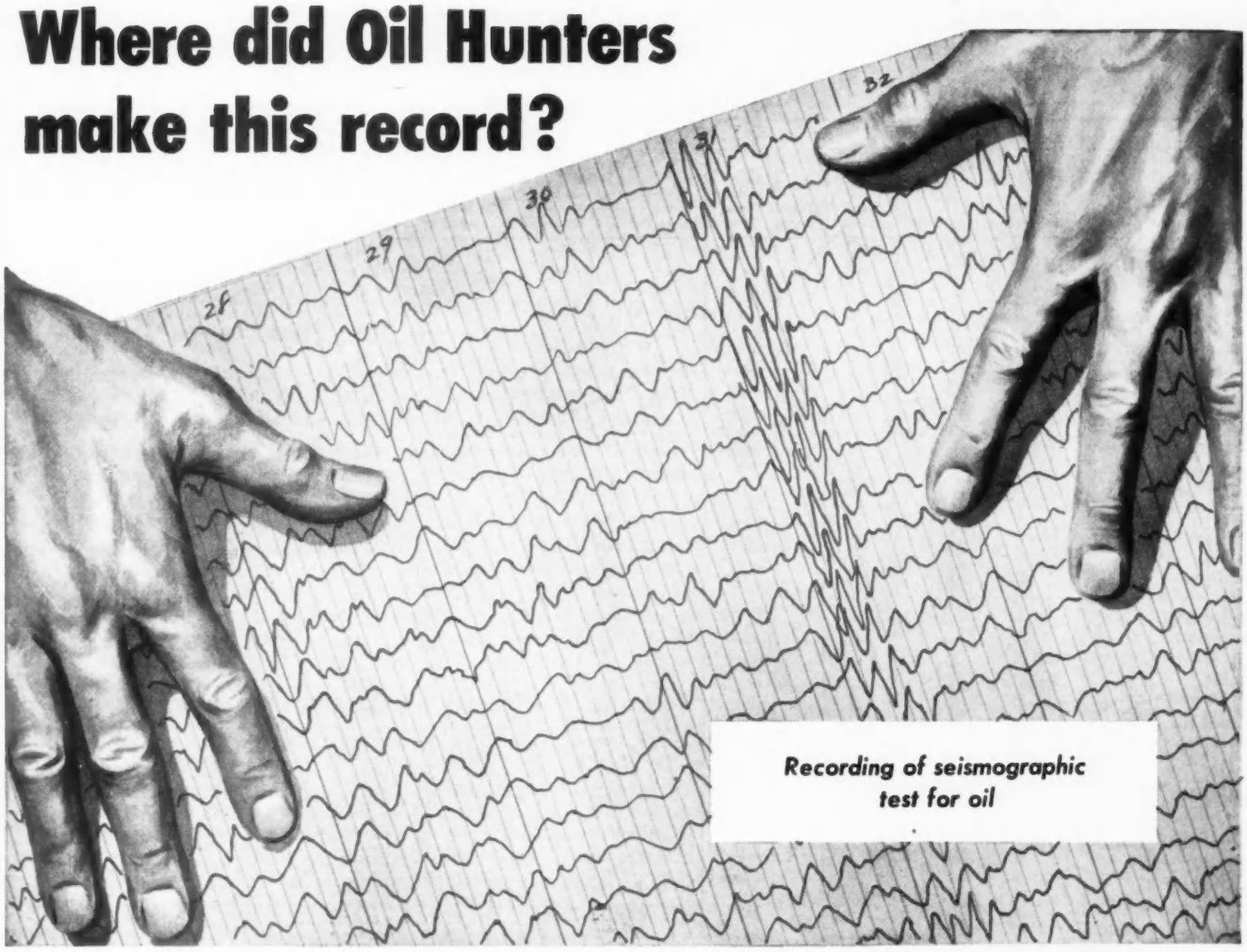
YEAR	WORLD TOTAL	Percent Produced by U.S.	NORTH AMERICA				
			Canada	Mexico	United States	Cuba	Total North America
1896	114,199	53	727	.....	60,960	.....	61,687
1897	121,992	50	710	.....	60,476	.....	61,186
1898	124,979	44	758	.....	55,364	.....	56,122
1899	131,147	44	808	.....	57,071	.....	57,879
1900	149,137	43	913	.....	63,621	.....	64,534
1901	167,440	41	757	10	69,389	.....	70,156
1902	181,809	49	531	40	88,767	.....	89,338
1903	194,879	52	487	75	100,461	.....	101,023
1904	217,948	54	553	126	117,081	.....	117,760
1905	215,091	63	634	251	134,717	.....	135,602
1906	213,263	59	569	502	126,494	.....	127,565
1907	263,957	63	789	1,005	166,095	.....	167,889
1908	285,287	63	528	3,933	178,527	.....	182,988
1909	298,709	61	421	2,714	183,171	.....	186,306
1910	327,763	64	316	3,634	209,557	.....	213,507
1911	344,361	64	291	12,553	220,449	.....	233,293
1912	352,443	63	243	16,558	222,935	.....	239,736
1913	385,345	64	228	25,696	248,446	.....	274,370
1914	407,544	65	215	26,235	265,763	.....	292,213
1915	432,033	65	215	32,911	281,104	.....	314,230
1916	457,500	66	198	40,546	300,767	.....	341,511
1917	502,891	67	214	55,293	335,316	.....	390,823
1918	503,515	71	305	63,828	355,928	.....	420,061
1919	555,875	68	241	87,073	378,367	.....	465,681
1920	688,884	64	196	157,069	442,929	.....	600,194
1921	766,002	62	188	193,398	472,183	.....	665,769
1922	858,898	65	179	182,278	557,531	.....	739,988
1923	1,015,736	72	170	149,585	732,407	.....	882,162
1924	1,014,318	70	161	139,678	713,940	.....	853,779
1925	1,068,933	71	332	115,515	763,743	.....	879,590
1926	1,096,823	70	364	90,421	770,874	.....	861,659
1927	1,262,582	71	477	64,121	901,129	.....	965,727
1928	1,324,774	68	624	50,151	901,474	.....	952,249
1929	1,485,867	68	1,117	44,688	1,007,323	.....	1,053,128
1930	1,410,037	64	1,522	39,530	898,011	.....	939,063
1931	1,372,532	62	1,543	33,039	851,081	.....	885,663
1932	1,309,677	60	1,044	32,805	785,159	.....	819,008
1933	1,442,146	63	1,145	34,001	905,656	23	940,825
1934	1,522,288	60	1,417	38,172	908,065	28	947,682
1935	1,654,495	60	1,447	40,241	996,596	47	1,038,331
1936	1,791,546	61	1,500	41,028	1,099,687	62	1,142,277
1937	2,039,231	63	2,944	46,907	1,279,160	33	1,329,044
1938	1,988,041	61	6,966	38,506	1,214,355	78	1,259,905
1939	2,086,160	60.6	7,838	42,898	1,264,962	112	1,315,810
1940	2,149,821	62.9	8,591	44,036	1,353,214	142	1,405,983
1941	2,220,657	63.1	10,134	42,196	1,402,228	150	1,454,708
1942	2,093,100	66.2	10,365	34,815	1,386,645	151	1,431,976
1943	2,256,637	66.7	10,052	35,163	1,505,613	107	1,550,935
1944	2,592,289	64.7	10,099	38,203	1,677,904	109	1,726,315
1945	2,594,697	66.0	8,483	43,547	1,713,655	149	1,765,834
1946	2,745,430	63.2	7,586	49,235	1,733,939	269	1,791,029
1947	3,022,139	61.4	7,692	56,284	1,856,987	300	1,921,263
1948	3,433,234	58.8	12,287	58,508	2,020,185	159	2,091,139
1949	3,404,025	54.1	21,305	60,910	1,841,940	206	1,924,361
1950	3,802,843	51.9	29,044	72,443	1,973,574	156	2,075,217
1951	4,286,443	52.4	47,615	77,312	2,247,711	128	2,372,766
1952	4,495,896	51.0	61,103	77,275	2,289,836	36	2,428,250
*1953	4,732,510	49.8	80,922	71,366	2,357,481	36	2,509,805
Total	79,078,562	60.5	381,119	2,708,307	47,814,116	2,481	50,906,023

South America, Since Beginning in 1896

YEAR	Argentina	Barbados	Bolivia	Brazil	Chile	Colombia	Ecuador	Peru	Trinidad	Venezuela	Total South America
1896	.....	.....	.....	.....	.....	.....	.....	47	.....	.....	47
1897	.....	.....	.....	.....	.....	.....	.....	71	.....	.....	71
1898	.....	.....	.....	.....	.....	.....	.....	71	.....	.....	71
1899	.....	.....	.....	.....	.....	.....	.....	89	.....	.....	89
1900	.....	.....	.....	.....	.....	.....	.....	274	.....	.....	274
1901	.....	.....	.....	.....	.....	.....	.....	275	.....	.....	275
1902	.....	.....	.....	.....	.....	.....	.....	287	.....	.....	287
1903	.....	.....	.....	.....	.....	.....	.....	278	.....	.....	278
1904	.....	.....	.....	.....	.....	.....	.....	290	.....	.....	290
1905	.....	.....	.....	.....	.....	.....	.....	373	.....	.....	373
1906	.....	.....	.....	.....	.....	.....	.....	531	.....	.....	531
1907	B	.....	.....	.....	.....	.....	.....	751	.....	.....	751
1908	12	.....	.....	.....	.....	.....	.....	945	B	.....	957
1909	18	.....	.....	.....	.....	.....	.....	1,411	57	.....	1,486
1910	20	.....	.....	.....	.....	.....	.....	1,258	143	.....	1,421
1911	13	.....	.....	.....	.....	.....	.....	1,465	285	.....	1,763
1912	47	.....	.....	.....	.....	.....	.....	1,752	437	.....	2,236
1913	131	.....	.....	.....	.....	.....	.....	2,071	504	.....	2,706
1914	276	.....	.....	.....	.....	.....	.....	1,837	644	.....	2,757
1915	513	.....	.....	.....	.....	.....	.....	2,579	750	.....	3,842
1916	867	.....	.....	.....	.....	.....	.....	2,593	929	.....	4,389
1917	1,218	.....	.....	.....	.....	.....	57	2,577	1,602	120	5,574
1918	1,353	.....	.....	.....	.....	.....	C60	2,527	2,082	333	6,355
1919	1,331	.....	.....	.....	.....	.....	C60	2,628	1,841	425	6,285
1920	1,651	.....	.....	.....	.....	.....	C60	2,817	2,083	457	7,068
1921	2,036	.....	.....	.....	.....	67	C60	3,699	2,354	1,433	9,849
1922	2,866	.....	.....	.....	.....	323	C60	5,314	2,445	2,201	13,209
1923	3,400	.....	.....	.....	.....	425	87	5,699	3,051	4,201	16,863
1924	4,639	.....	.....	.....	.....	445	C100	8,379	4,057	9,042	26,662
1925	6,336	.....	.....	.....	.....	1,007	160	9,232	4,387	19,687	40,809
1926	7,851	.....	.....	.....	.....	6,444	214	10,762	4,971	36,911	67,153
1927	8,630	.....	.....	.....	.....	15,014	537	10,127	5,380	63,134	102,822
1928	9,070	.....	.....	.....	.....	19,897	1,084	12,006	7,684	105,749	155,490
1929	9,391	.....	B	.....	.....	20,385	1,381	13,422	8,716	137,472	190,767
1930	9,002	.....	56	.....	.....	20,346	1,553	12,449	9,419	136,669	189,494
1931	11,709	.....	25	.....	.....	18,237	1,762	10,089	9,744	116,613	168,179
1932	13,139	.....	44	.....	.....	16,414	1,597	9,899	10,126	116,541	167,760
1933	13,691	.....	112	.....	.....	13,158	1,620	13,257	9,561	117,720	169,119
1934	14,024	.....	159	.....	.....	17,341	1,637	16,314	10,894	136,103	196,472
1935	14,297	.....	164	.....	.....	17,598	1,732	17,067	11,671	148,254	210,783
1936	15,458	.....	105	.....	.....	18,756	1,942	17,593	13,237	154,794	221,885
1937	16,355	.....	122	.....	.....	20,599	2,161	17,457	15,503	186,230	258,427
1938	17,076	.....	226	.....	.....	21,582	2,246	15,839	17,737	188,174	262,880
1939	18,613	.....	215	.....	.....	23,857	2,313	13,508	19,270	206,470	284,246
1940	20,609	.....	288	2	.....	25,593	2,349	12,126	22,227	185,570	268,764
1941	21,873	.....	235	3	.....	24,553	1,557	11,935	20,506	228,430	309,092
1942	23,704	2	308	33	.....	10,487	2,278	13,629	22,069	147,675	220,185
1943	27,714	2	334	48	.....	13,261	2,315	14,654	21,385	177,631	257,344
1944	24,230	1	314	58	.....	22,291	2,967	14,389	22,139	257,046	343,435
1945	22,881	2	382	79	.....	22,449	2,664	13,744	21,093	323,156	406,450
1946	20,604	1	363	67	.....	22,118	2,323	12,468	20,233	388,486	466,663
1947	21,846	B	377	97	.....	24,794	2,282	12,764	20,521	434,905	517,586
1948	23,734	.....	464	144	.....	23,801	2,563	14,069	20,111	490,015	574,901
1949	22,589	.....	678	109	.....	29,722	2,617	14,796	20,617	482,316	573,444
1950	23,353	.....	616	339	629	34,060	2,632	15,012	20,632	546,783	644,056
1951	24,465	.....	523	691	759	38,398	2,708	16,110	20,843	622,216	726,713
1952	24,807	.....	526	750	906	38,652	2,839	16,403	21,258	660,254	766,395
*1953	28,014	.....	512	992	1,109	39,438	2,908	16,294	22,145	637,064	748,476
Total	535,456	8	7,148	3,412	3,403	621,512	57,485	450,302	477,343	7,470,280	9,626,349

* **WORLD OIL** from private sources. B Less than 1,000 barrels. C Estimated production.

Where did Oil Hunters make this record?



Recording of seismographic test for oil

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World Crude Oil Production, By Countries, By Years (Part 2)

(Complete production history of world, in thousands of barrels of 42 U. S. Gallons. Sources: *Mineral Resources and Minerals Yearbook*, except as otherwise indicated.)

Asia Since Beginning in 1875

	ASIA—Middle East								ASIA—Far East											
Year	Bahrain	Iran	Iraq	Kuwait	Qatar	Saudi Arabia	Turkey	Middle East Total	[E]Burma-India Pakistan: Burma	Pakistan	India	China	Indonesia	Japan	New Guinea	Sakhalin	Sarawak-Brunei	[H]Taiwan (Formosa)	Total Far East	[F]Total Asia
1874																				
1875														5					5	5
1876																				
1877														7					7	7
1878														10					10	10
1879														18					18	18
1880														23					23	23
1881														26					26	26
1882														17					17	17
1883														15					15	15
1884														20					20	20
1885														28					28	28
1886														30					30	30
1887														38					38	37
1888														29					29	28
1889														37					37	39
1890										94				53					147	147
1891										118				52					170	170
1892										190				53					243	243
1893										242				69					311	311
1894										299			600	106					1,005	1,005
1895										327			688	173					1,188	1,188
1896										372			1,216	170					1,758	1,758
1897										430			1,427	237					2,094	2,094
1898										546			2,552	262					3,360	3,360
1899										542			2,964	319					3,825	3,825
1900										941			1,796	539					3,276	3,276
1901										1,079			2,253	871					4,203	4,203
1902										1,431			4,014	1,117					6,562	6,562
1903										1,617			2,430	996					5,043	5,043
1904										2,510			5,770	1,209					9,489	9,489
1905										3,385			6,508	1,219					11,112	11,112
1906										4,137			7,850	1,347					13,334	13,334
1907										4,016			8,181	1,564					13,761	13,761
1908										4,344			9,983	1,718					16,045	16,045
1909										5,047			10,283	1,871					17,201	17,201
1910										6,677			11,042	1,887					19,606	19,606
1911										6,138			11,031	1,829					18,998	18,998
1912										6,451			12,173	1,737					20,361	20,361
1913		1,857						1,857		7,117			10,846	1,659					19,622	19,622
1914		2,910						2,910		7,930			11,172	1,940			141		21,183	23,040
1915		3,616						3,616		7,410			11,422	2,636			318		21,786	24,696
1916		4,477						4,477		8,202			11,920	2,928			392		23,442	27,058
1917		7,147						7,147		8,491			12,547	2,963			629		24,630	29,107
1918		8,623						8,623		8,079			13,180	2,861			542		24,662	31,809
1919		10,139						10,139		8,188			12,778	2,441			504		23,911	32,534
1920		12,230						12,230		8,736			15,508	2,238			596		27,078	37,217
1921		16,673						16,673		8,375			17,529	2,221			1,020		29,145	41,375
1922		22,247						22,247		8,734			16,958	2,233		2	1,411		29,338	46,011
1923		25,230						25,230		8,529			17,066	2,055		[B]	2,849		30,506	52,753
1924		32,373						32,373		8,406			19,870	1,804		9	3,940		34,029	59,259
1925		35,038						35,038		8,416			20,473	1,814		80	4,163		34,946	67,319
1926		35,842						35,842		8,274			21,422	1,915		87	4,257		35,955	70,993
1927		39,688	338					40,026		8,011			21,243	1,785		181	4,942		36,162	72,004
1928		43,461	713					44,174		8,032			27,459	1,789		440	4,943		42,663	82,689
1929		42,145	798					42,943		8,741			32,118	1,944		677	[G]5,223		48,703	92,877
1930		45,828	913					46,741		8,747			39,279	2,023		[D]1,134	5,290		56,473	99,416
1931		44,376	830					45,206		8,292			41,729	1,950		[D]1,805	4,907		58,683	105,424
1932		49,471	836					50,307		8,200			35,539	2,050		2,734	3,854		52,377	97,583
1933	31	54,392	917					55,340		8,817			39,001	1,630		2,631	3,796		55,875	106,182
1934	285	57,851	7,689					65,825		8,743			42,606	1,455		2,338	4,490		59,632	114,972
1935	1,265	57,273	27,408					85,946	7,181	10,503 [E]	2,038		46,925	1,834		2,881	5,140		67,283	133,108
1936	4,645	62,718	30,406			20		97,789	7,588	[E]	1,978		47,171	2,249		2,545	5,546		66,730	152,676
1937	7,762	77,804	31,836			65		117,467	7,848	[E]	2,162		50,025	2,440		3,212	5,209		70,452	168,241
1938	8,298	78,372	32,643			495		119,808	7,538	[E]	2,488		56,724	2,488		3,656	6,009		78,887	196,354
1939	7,589	78,151	30,791			3,934		120,465	7,873	[E]	2,327	4	57,318	2,511		[C]3,821	6,913		80,589	200,397
1940	7,074	66,317	24,225			5,075		102,691	7,731	[E]	2,302	10	62,087	2,654		4,000	7,097		86,042	206,507
1941	6,794	50,777	12,650			4,310		74,531	7,762	[E]	2,899	87	62,011	2,639		4,000	7,047		85,740	188,431
1942	6,241	72,256	19,726			4,530		102,753	2,500	[E]	2,792	340	53,704	1,929		4,000	6,864	62	77,307	151,838
1943	6,572	74,612	24,848			4,868		110,900	1,000	[E]	2,735	447	24,000	1,652		4,000	3,000	48	38,332	141,085
1944	6,714	102,045	30,943			7,794		147,496	750	[E]	2,784	505	48,294	1,727		5,000	4,500	38	63,741	174,641
1945	7,309	130,526	35,112			21,311		194,258	725	[E]	2,363	484	22,260	1,601		5,000	6,000	40	38,940	186,436
1946	8,010	146,819	35,665	5,931		59,944		256,369	15	[E]	2,193	513	7,600	1,544		6,000	2,100	14	20,830	215,088
1947	9,411	154,998	35,834	16,225		89,852		306,320	59	356	1,863	374	2,100	1,343		6,000	2,050	16	14,230	270,599
1948	10,915	190,384	26,115	46,500		142,853	13	416,780	341	490	1,875	533	8,020	1,276		[C]7,000	12,970	22	31,940	338,260
1949	10,985	204,712	30,957	90,000	750	174,008	95	511,507	248	824	1,906	730	31,765	1,122	135	7,000	20,124	23	63,408	480,188
1950	11,016	242,475	49,726	125,722	12,268	199,547	108	640,862	450	1,281	1,867	730	43,206	1,353	1,726	7,000	25,108	22	82,123	593,630
1951	10,994	127,600	65,122	204,910	18,009	277,963	133	704,731	645	1,348	1,949	730	48,400	2,048	1,748	7,000	30,958	23	94,505	735,367
1952	11,004	10,100	140,799	273,433	25,255	301,861	146	762,598	645	1,580	1,900	730	55,453	2,337	1,746	7,000	37,506	21	108,735	813,466
*1953	10,979	9,890	210,298	315,246	32,527	308,294	178	887,412	776	2,050	1,975	730	62,495	2,100	1,725	7,000	38,300	18	116,493	879,091
Total	153,893	2,533,443	908,138	1,077,967	88,809	1,606,724	673	6,369,647		[E]355,906		6,947	74,316	2,107	1,791	7,000	36,773	24	127,542	1,014,954
													1,458,300	104,989	8,871	115,240	327,421	371	2,378,045	8,747,692

* WORLD OIL from private sources. [B] Less than 1,000 barrels. [C] Estimated production [D] Year ended September 30. [E] Separation of British India and Burma prior to 1935 not available from U.S. Bureau of Mines data used here. Data by Dudley Stamp in "Petroleum Development and Technology, 1933" and in A.I.M.E. "Transactions" indicate cumulative through 1934 as follows: Burma 184,528, India, 20, 756. Pakistan included with India prior to 1947. [F] Exclusive of U.S.S.R. fields in Asia, other than Sakhalin, which are included with U.S.S.R. in Europe. [G] Beginning of production in Brunei. [H] Formosa included with Japan prior to 1941.

# of your casing?

WHY **THE ROTO-VERT IS SAFE AND SIMPLE TO USE AND COSTS LITTLE TO RUN**

This helix-blade-type scraper can be either "spudded" (reciprocated vertically) or rotated for the removal of gun-perforation burrs, imbedded bullets, cement sheath or other obstructions from the inside of the casing.

The body is machined from bar stock, with two sets—a total of six—rugged Blade Blocks positioned for overlapping, 360-degree scraping coverage. The most outstanding feature of the Blade Blocks is the direction and angle of shear of the scraping edges. The slant of these scraping surfaces is in a direction OPPOSITE from that encountered on other helix-blade-type casing scrapers, and the shearing edge is set at a smaller angle from the horizontal. These features result in the fact that the ROTO-VERT will not "screw" down past burrs as it is being rotated. And when it comes to removing cement sheath or other casing coatings, you are assured of actually removing the material with the ROTO-VERT, instead of merely cutting threads in it.

REMOVING PERFORATION BURRS AND BULLETS

On rotary rigs best results are obtained by first running the ROTO-VERT Scraper *completely through* the perforated section WITHOUT ROTATION. This initial run will either shear or knock off the majority of imbedded or projecting bullets, and shear away most of the ragged perforation burrs. Then pull back the ROTO-VERT Scraper and rotate it through the perforated section. This second run permits the helix scraping edges to shear to their fullest extent, leaving perforation holes practically flush with the casing I.D., and the entire perforated section clean and restored to gauge.

When running the ROTO-VERT on tubing, or on a wire line (with suitable sinker bars and jars) it is merely run through the perforated section, then pulled back and run through again. If the ROTO-VERT runs through the perforated section smoothly (as indicated by checking the weight indicator) complete burr and bullet removal is a certainty.

REMOVING CEMENT SHEATH, HARDENED MUD OR SCALE

Recommended procedure is to install the ROTO-VERT just above the bit when drilling out cement, to remove the thin sheath of cement always left, even though a maximum gauge bit is being used. Hardened mud, cement, paraffin, or mill scale are completely removed in a single run.

On old wells (or when rotary equipment is not present) the ROTO-VERT, run on tubing, will successfully remove various casing coatings WITHOUT ROTATION. A spudding action usually quickly clears up any rough or stubborn "tight spots."

A modified ROTO-VERT can be furnished to operate with equal success when run on a wire line equipped with sinker bars and jars.

BAKER OIL TOOLS, INC.

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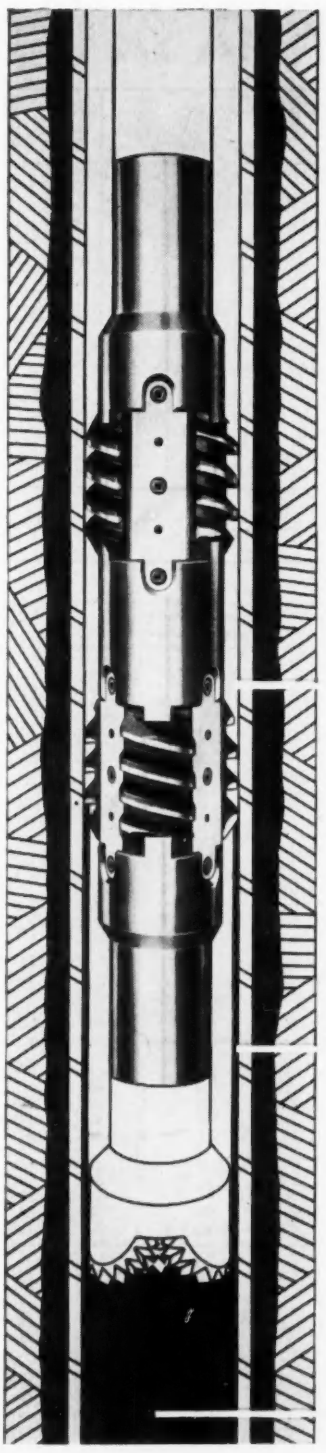

Even when a maximum gauge bit is used for drilling-out, a thin sheath of hardened cement remains to interfere with future operations. To visualize how ROTO-VERT removes this sheath, see left.

All cement, scale, burrs, etc., have been removed by the ROTO-VERT Scraper, and the vital "working surface" of casing is left clean and smooth.

This thin sheath of hardened cement always remains after the bit has passed.

Cement to be drilled out.

Cross-section of casing showing gun-perforation burr, before scraping . . .

and after ROTO-VERT was run.

This brittle cement sheath prevents the slips of pack-off tools from gripping the casing.

. . . Here is cut section of the same casing showing how slips tried, *unsuccessfully*, to set against the cement sheath.

Call Baker

for consultation and service on BAKER ROTO-VERT Casing Scrapers

World Crude Oil Production, By Countries, By Years (Part 3)

(Complete production history of world, in thousands of barrels of 42 U. S. Gallons. Sources: *Mineral Resources and Minerals Yearbook*, except as otherwise indicated.)

Europe, 1857-1900

YEAR	Italy	Roumania	[F] U.S.S.R. (Russia)	[F] Total Europe	YEAR	Germany	Italy	Poland	Roumania	[F] U.S.S.R. (Russia)	[F] Total Europe	YEAR	Germany	Italy	Poland	Roumania	[F] U.S.S.R. (Russia)	[F] Total Europe
1856	.....	.....	.....	.....	1871	.....	[B]	.....	90	165	255	1886	74	2	306	168	18,006	18,556
1857	.....	2	.....	2	1872	.....	[B]	.....	91	185	276	1887	74	1	344	182	18,368	18,969
1858	.....	4	.....	4	1873	.....	[B]	.....	104	475	579	1888	85	1	467	219	23,049	23,821
1859	.....	4	.....	4	1874	.....	1	150	103	583	837	1889	68	1	515	298	24,609	25,491
1860	.....	9	.....	9	1875	.....	1	158	108	697	964	1890	108	3	659	383	28,691	29,844
1861	[B]	17	.....	17	1876	.....	3	164	111	1,321	1,599	1891	109	8	631	488	34,573	35,809
1862	[B]	23	.....	23	1877	.....	3	170	108	1,801	2,082	1892	101	18	646	593	35,775	37,133
1863	[B]	28	41	69	1878	.....	4	176	109	2,401	2,690	1893	100	19	693	535	40,457	41,804
1864	[B]	33	65	98	1879	.....	3	215	110	2,761	3,089	1894	123	21	949	508	36,375	37,976
1865	2	39	67	108	1880	9	2	229	115	3,001	3,356	1895	121	26	1,453	576	46,140	48,316
1866	1	42	83	126	1881	29	1	287	122	3,601	4,040	1896	145	18	2,444	543	47,221	50,371
1867	1	51	120	172	1882	58	2	330	136	4,538	5,064	1897	166	14	2,226	571	54,399	57,376
1868	[B]	56	88	144	1883	27	2	365	139	6,002	6,535	1898	184	15	2,376	776	61,610	64,961
1869	[B]	59	202	261	1884	46	3	408	211	10,805	11,473	1899	192	16	2,314	1,426	65,955	69,903
1870	[B]	84	204	288	1885	41	2	465	193	13,925	14,626	1900	358	12	2,347	1,629	75,780	80,126

Europe and Africa, 1901-1952

	EUROPE													AFRICA					
YEAR	Albania	Austria	Czecho-slovakia	Great Britain	France	Ger-many	Hun-gary	Italy	Nether-lands	Poland	Rou-mania	[F] U.S.S.R. (Russia)	Yugo-slavia	[F] Total Europe	Egypt	Al-geria	Mo-rocco	Total Africa	Austra-lia-N. Zealand	Rest of World
1901	.....	.....	.....	.....	.....	314	.....	16	.....	3,251	1,678	85,168	.....	90,427	.....	.....	.....	.....	.....	20
1902	.....	.....	.....	.....	.....	354	.....	19	.....	4,142	2,060	80,540	.....	87,115	.....	.....	.....	.....	.....	26
1903	.....	.....	.....	.....	.....	446	.....	18	.....	5,235	2,763	75,591	.....	84,053	.....	.....	.....	.....	.....	36
1904	.....	.....	.....	.....	.....	637	.....	26	.....	5,947	3,599	78,537	.....	88,746	.....	.....	.....	.....	.....	40
1905	.....	.....	.....	.....	.....	561	.....	44	.....	5,766	4,421	54,960	.....	65,752	.....	.....	.....	.....	.....	30
1906	.....	.....	.....	.....	.....	579	.....	54	.....	5,468	6,378	58,897	.....	71,376	.....	.....	.....	.....	.....	30
1907	.....	.....	.....	.....	.....	757	.....	60	.....	8,456	8,118	61,851	.....	79,242	.....	.....	.....	.....	.....	30
1908	.....	.....	.....	.....	.....	1,009	.....	51	.....	12,612	8,252	62,187	.....	84,111	.....	.....	.....	.....	.....	30
1909	.....	.....	.....	.....	.....	1,019	.....	42	.....	14,933	9,327	65,970	.....	91,291	.....	.....	.....	.....	.....	20
1910	.....	.....	.....	.....	.....	1,032	.....	51	.....	12,673	9,724	70,337	.....	93,817	.....	.....	.....	.....	.....	20
1911	.....	.....	.....	.....	.....	1,017	.....	75	.....	10,519	11,108	66,184	.....	88,903	21	.....	.....	21	.....	20
1912	.....	.....	.....	.....	.....	1,031	.....	54	.....	8,535	12,976	68,019	.....	90,615	214	.....	.....	214	.....	20
1913	.....	.....	.....	.....	.....	857	.....	47	.....	7,818	13,555	62,834	.....	85,111	98	.....	.....	98	.....	20
1914	.....	.....	.....	.....	.....	781	.....	40	.....	6,436	12,827	67,020	.....	87,104	753	1	.....	754	.....	20
1915	.....	.....	.....	.....	.....	703	.....	44	.....	5,352	12,030	68,548	.....	86,677	212	4	.....	216	.....	10
1916	.....	.....	.....	.....	.....	656	.....	51	.....	6,587	8,945	65,817	.....	82,056	404	8	.....	412	.....	25
1917	.....	.....	.....	.....	[G]	642	.....	41	.....	6,228	3,721	63,072	.....	73,704	943	9	.....	952	.....	29
1918	.....	.....	.....	.....	363	270	.....	35	.....	6,032	8,730	27,168	.....	42,598	1,935	7	.....	1,942	.....	25
1919	.....	.....	48	2	334	265	.....	35	.....	6,096	6,618	31,752	.....	45,150	1,517	5	.....	1,522	.....	20
1920	.....	.....	69	3	356	246	.....	35	.....	5,607	7,435	25,430	.....	39,181	1,042	4	.....	1,046	.....	20
1921	.....	.....	94	3	389	274	.....	32	.....	5,167	8,368	28,968	.....	43,295	1,255	3	.....	1,258	.....	20
1922	.....	.....	120	1	496	319	.....	31	.....	5,227	9,843	35,692	.....	51,729	1,188	9	.....	1,197	.....	22
1923	.....	.....	74	1	494	346	.....	34	.....	5,402	10,867	39,147	.....	56,365	1,054	9	.....	1,063	.....	24
1924	.....	.....	76	2	497	406	.....	39	.....	5,657	13,369	45,355	.....	65,401	1,122	11	.....	1,133	.....	24
1925	.....	.....	158	3	459	541	.....	61	.....	5,960	16,650	52,448	.....	76,280	1,226	12	.....	1,238	.....	23
1926	.....	.....	150	2	478	653	.....	41	.....	5,844	23,314	64,311	.....	94,793	1,188	9	.....	1,197	.....	17
1927	.....	.....	112	2	504	663	.....	47	.....	5,342	26,368	77,018	.....	110,056	1,267	8	.....	1,275	.....	13
1928	.....	.....	94	1	512	630	.....	46	.....	5,492	30,773	[D]84,745	.....	122,293	1,842	8	.....	1,850	.....	15
1929	.....	.....	93	.....	535	704	.....	45	.....	4,988	34,758	[D]99,507	.....	140,630	1,868	20	.....	1,888	.....	28
1930	.....	.....	157	[B]	523	1,182	.....	59	.....	4,904	41,624	[D]125,555	.....	174,004	1,996	16	.....	2,012	.....	40
1931	.....	.....	134	[E]	520	1,606	.....	124	.....	4,662	49,127	162,842	.....	219,015	2,038	[E]	.....	2,038	.....	54
1932	.....	.....	126	[E]	530	1,608	.....	208	.....	4,116	53,815	154,367	.....	214,770	1,895	[E]	7	1,902	.....	62
1933	11	.....	122	[E]	562	1,665	.....	204	.....	4,072	54,020	154,840	.....	215,496	1,663	[E]	7	1,670	.....	71
1934	10	.....	178	[E]	557	2,187	.....	151	.....	3,913	62,063	174,318	.....	243,377	1,546	[E]	6	1,552	.....	96
1935	41	44	133	[E]	541	2,996	.....	119	.....	3,812	61,310	182,386	2	251,384	1,301	[E]	4	1,305	5	4
1936	273	50	127	[E]	503	3,115	.....	123	.....	3,789	63,659	186,206	1	257,846	1,278	[E]	4	1,282	5	4
1937	619	221	123	[E]	502	3,176	16	110	.....	3,716	52,452	193,241	4	254,180	1,196	[E]	22	1,218	4	4
1938	752	383	130	[E]	513	3,861	288	101	.....	3,763	48,487	204,956	9	263,243	1,581	[E]	27	1,608	4	4
1939	934	1,240	120	.....	500	4,487	1,103	91	.....	3,898	45,648	216,866	10	274,897	4,666	[E]	27	4,693	3	4
1940	1,497	2,808	163	124	496	7,371	1,881	85	.....	3,891	43,168	218,600	10	280,094	6,505	[E]	27	6,532	3	14
1941	1,334	4,238	183	223	414	6,303	3,183	95	.....	1,793	40,517	238,150	10	296,443	8,546	[E]	27	8,573	3	.....
1942	1,601	5,899	271	605	463	5,191	5,037	101	.....	2,794	42,094	227,470	10	291,536	8,275	[E]	41	8,316	2	.....
1943	1,001	7,478	200	839	356	4,973	6,347	86	1	3,500	39,182	200,750	10	264,723	8,953	.....	39	8,992	2	.....
1944	334	8,218	185	703	300	6,154	6,277	55	12	3,000	26,191	275,000	220	326,649	9,416	4	32	9,452	2	.....
1945	267	3,074	91	532	202	3,935	5,018	53	41	750	34,772	148,953	200	197,888	9,406	2	26	9,434	3	.....
1946	1,000	5,734	196	412	368	4,539	5,146	83	435	866	31,434	157,673	160	208,046	9,070	1	20	9,091	2	.....
1947	2,000	6,285	210	351	356	4,032	4,330	81	1,478	951	28,552	187,463	290	236,379	8,627	1	21	8,649	2	.....
1948	1,500	5,149	204	323	369	4,489	3,647	71	3,443	1,039	34,000	218,000	270	273,504	13,398	1	100	13,499	3	.....
1949	2,188	6,100	292	338	411	5,947	3,791	71	4,314	1,125	33,700	337,700	470	296,447	15,997	2	136	16,135	8	.....
1950	2,800	10,200	292	340	909	8,107	3,700	63	4,897	1,205	32,000	226,200	780	331,493	16,373	24	305	16,702	8	.....
1951	1,200	15,477	644	335	2,036	9,681	3,500	135	4,942	1,502	31,000	285,000	1,092	356,544	16,311	49	587	16,947	7	.....
1952	1,100	20,400	740	407	2,377	12,435	3,500	487	4,975	1,700	33,000	322,400	1,067	404,588	16,464	357	749	17,570	2	.....
*1953	1,000	20,500	750	396	2,510	15,397	3,350	675	5,579	1,750	33,100	355,000	1,050	441,057	16,821	642	753	18,216	2	.....
Total	21,462	124,498	6,859	5,948	22,235	144,367	60,114	4,851	30,117	284,770	1,354,686	7,525,148	5,665	9,590,720	202,471	1,226	2,967	206,664	70	1,044

* **WORLD OIL** from private sources. [B] Less than 1,000 barrels. [C] Estimated production [D] Year ended September 30. [E] No more data available. [F] Includes fields in Russian Asia other than Sakhalin. [G] France's earlier production credited to Germany.

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What's Happening

AMONG MEN IN THE INDUSTRY

Southern Production Company, Inc., Fort Worth, has announced the election of **Roy C. Williamson** as president. Williamson succeeds **C. T. Chenery** who has held positions of chairman of the board and president. Chenery remains as chairman of the board. Williamson joined Southern Production in 1943 and was elected a director and vice president in 1947. Williamson took his first oil field job with J. K. Hughes Development Company in 1926. He entered Oklahoma University and obtained his petroleum engineering degree working in the Oklahoma City Field while in college. Williamson joined The Pure Oil Company and later went with Lion Oil Company resigning as production superintendent in 1943 to join Southern Production.

Roy C. Williamson

•

Lone Star Gas Company has increased its executive staff to include six new vice presidents and an executive vice president and has promoted two vice presidents to the rank of senior vice presidents. **Elmer F. Schmidt** and **Chester L. May**, vice presidents, were elected senior vice presidents and **L. T. Potter**, assistant to the president, was named executive vice president and elected to the board of directors. **Marshall Newcomb**, general counsel and member of the board, was elected a vice president. Other new vice presidents are **Julian L. Foster**, superintendent of transmission; **E. A. Brown**, manager of exploration and gas supply; **M. L. Bird**, operating manager of the general division of distribution; **W. F. Wright**, general manager of Dallas division of distribution, and **Joe C. Darrow**, general manager of Fort Worth Division of distribution.

•

James J. Nance, president of Packard Motor Car Company, has been elected a member of the board of directors of **The Standard Oil Company (Ohio)**.

•

R. W. Rine Drilling Company, Wichita, Kansas, has increased its staff with **Paul A. Harper**, formerly with Anschutz Drilling, becoming geologist and contact representative; and **John H. Wilson**, formerly with C. L. McMahon, Inc., production superintendent and engineers.

•

Glen W. Barb, petroleum engineer for **Magnolia Petroleum Company** at Duncan, Okla., has been promoted to district petroleum engineer at Wewoka.

•

Roger F. Williams, petroleum engineer, has moved his office from Pampa, Texas, to Tulsa, where he will be associated with Tom Spencer, consulting geologist.

B. A. Otis

Henry Power

B. A. Otis and Henry Power of **General Petroleum Corporation** have retired from service with the company. Otis is manager of the Land department and has been with General Petroleum since 1925. An engineer and geologist, Otis worked in both capacities. He has been in oil land and leasing work since 1932 and has managed the Land department since 1948. Power, staff engineer in the Production department, has been with the company since 1919. He was in geological work until 1928 when he was promoted to office engineer. He has held his present position since 1942.

•

Wallace E. Avery has been named assistant secretary of **The Texas Company**. Avery has been with the company since 1945 and has been assistant general manager of the company's industrial and public relations department since February 1951.

•

Loffland Brothers Company has recognized six employes for long years of service. Gold watches in recognition of 25 years continuous service were presented to **J. O. Rundle**, vice president, Maracaibo, Venezuela; **George C. Mallory**, general superintendent, Lafayette, La.; **O. H. Poe**, assistant superintendent, New Iberia, La.; **Charles Brown**, toolpusher, Oklahoma City; **Clyde Long**, toolpusher, Oklahoma City; and **Leroy Patton**, truck pusher, Casper, Wyo.

•

Albert C. Oxley, field foreman in the Glenn's Camp area southwest of Robinson, Ill., since 1947, has retired after 40 years of service with **The Ohio Oil Company**. Formerly Oxley was foreman in charge of natural gasoline plants and the air and gas repressuring operations in Crawford County for several years. He is succeeded in his present position by his assistant, **William R. Black**, who joined Ohio in 1946.

•

John Tom Reynolds has opened offices in Dallas as a consulting petroleum engineer specializing in property management. Formerly with D. D. Feldman Oil and Gas in Dallas for three years, Reynolds is a graduate of the University of Kansas and has been with Sohio Petroleum Company and Halliburton Oil Well Cementing Company in the Gulf Coast, Midcontinent and Eastern producing states.

White Eagle Oil Company of Tulsa has opened a new division office in Midland, Texas, and has named **Victor H. Zoller** vice president of the company and in charge of the new office. **Helmerich and Payne, Inc.**, Tulsa, wholly owned subsidiary of White Eagle, has been active in the Permian Basin for 10 years and has a district office in Odessa, Texas, but the Midland office will be the first division exploration office for White Eagle. Zoller joined the oil and gas division of the Chicago Corporation in Shreveport in 1947 after being released from the Navy and was assistant manager of exploration for the firm at Fort Worth when he resigned in January.

Victor H. Zoller

•

A. B. Turner, assistant safety engineer for **Sohio Petroleum Company**, has transferred from Riverton, Wyo., to Oklahoma City.

•

James G. Stevens has resigned as executive vice president and treasurer of **Douglas Oil Company** of California and will be succeeded as executive vice president by **George T. Goggin**, now general counsel and a director. Stevens, who will become president of Preco, Incorporated, a Los Angeles manufacturer of specialty railway equipment, will continue as a director and member of the executive committee of Douglas Oil.

•

L. M. Sloan, district petroleum engineer for **Humble Oil & Refining Company**, has been moved to the Houston office as senior petroleum engineer.

•

Robert A. Bishop, division geologist of the Northwest Division of **Sohio Petroleum Company** in Billings, Mont., was promoted to manager of Canadian operations replacing **Brame Womack**, who was transferred from Regina to Oklahoma City. Bishop obtained his geology degree from the University of Wisconsin and did graduate work at Columbia University. He worked several years with Socony-Vacuum in South America and the United States. Prior to joining Sohio in 1949, Bishop was a consultant in Calgary, Alberta. Bishop's post was filled by **Walter Johnson**, staff geologist Northwest Division, stationed in Lewistown, Mont. Johnson was employed by Sohio in 1944 and held various positions in Sohio's Cleveland, Ohio and Houston offices.

•

Continental Oil Company has appointed **J. E. Finley**, division geophysicist with headquarters at Midland, Texas. Formerly division geophysicist at Roswell, N. M., Finley succeeds **Charlton Kerr**, who has been promoted to the company's execu-

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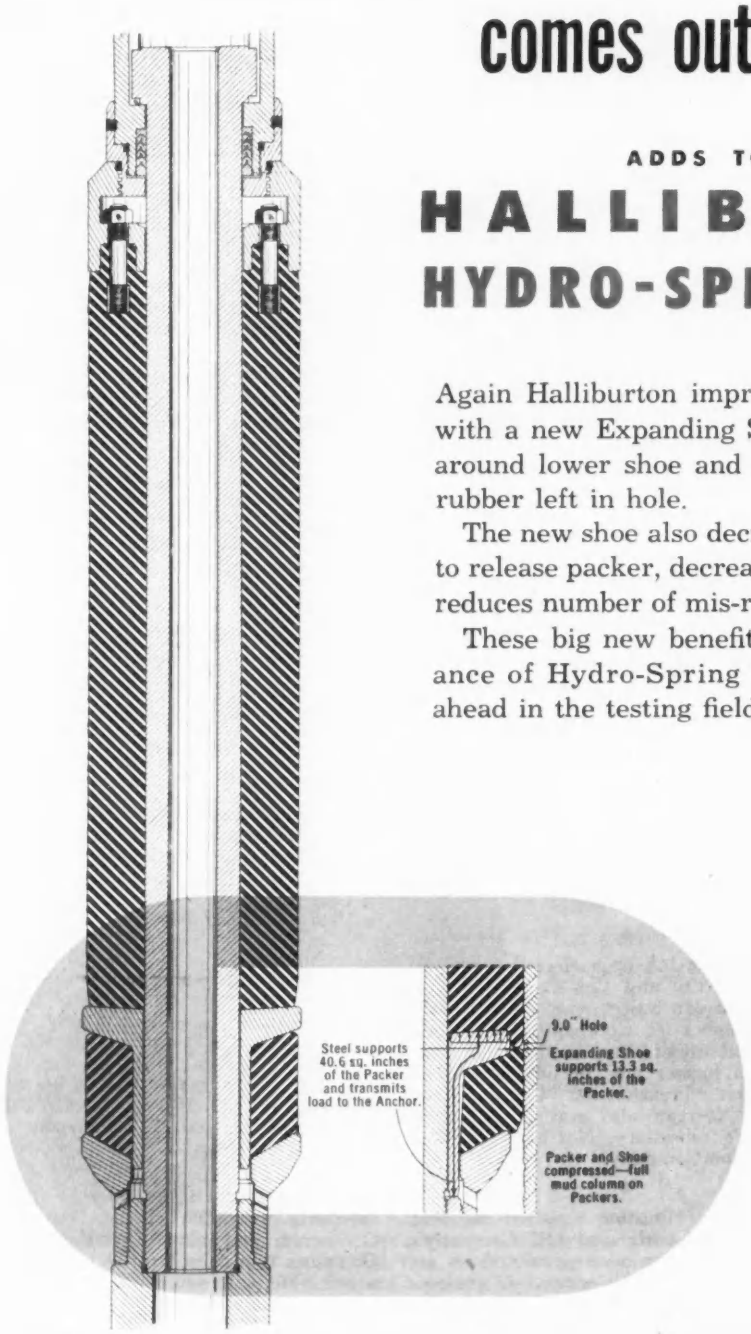
9.0" Hole
Steel supports 40.6 sq. inches of the Packer and transmits load to the Anchor.
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Packer and Shoe compressed—full mud column on Packers.

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Again Halliburton improves its Testing Service... this time with a new Expanding Shoe Packer that prevents extrusion around lower shoe and reduces considerably the amount of rubber left in hole.

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These big new benefits added to the remarkable performance of Hydro-Spring Tester make Halliburton fourbles ahead in the testing field. Operators everywhere find Hydro-Spring features add up to substantial savings in time, trouble, money. Now additional savings can be made at no extra cost by Halliburton's new Expanding Shoe Packer that leaves less rubber to be drilled out of hole.

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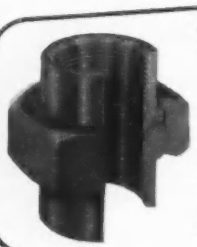

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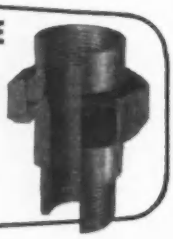

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tive offices at Houston. **G. H. Swenumson,** Conoco's geophysical supervisor at Denver, has been promoted to division geophysicist at Roswell. Finley joined Conoco in 1948 as an assistant computer with a geophysical party. He served as computer and party chief in several states prior to his promotion in 1951 to geophysical supervisor at Oklahoma City. In 1952 Finley was promoted to division geophysicist at Roswell. Swenumson joined Conoco in 1948 and served as a geophysical party chief in several states before his promotion in 1953 to geophysical supervisor at Denver.

•

Midstates Oil Corporation announces the appointment of **Ralph E. McMillen** as chief geophysicist. McMillen comes from Venezuela where he spent nine years, part of this time with Phillips Petroleum Company.

•

Keith Rathbun, Houston, has been promoted to regional geologist for **Continental Oil Company's** western region with headquarters at Los Angeles. Formerly assistant manager of the company's geological section at Houston, Rathbun joined Conoco in 1936 as a geologist at Ponca City, Okla. He transferred to Centralia, Ill., in 1939 and spent three years as a geologist in Illinois and six years as district geologist at San Antonio, Texas, before his promotion to division geologist at Houston in 1950. He was named assistant manager of Conoco's geological section in 1953.

•

Ish McKnight, oil scout, landman, producer and contractor, has become a full partner of the **Frisbie-Yancey Drilling Company.** McKnight will assume charge of the firm's exploration effort. McKnight was exploration manager for the Parker Drilling Company before joining Frisbie-Yancey.

•

W. C. Norman has been elected president of **Colorado Oil and Gas Corporation** of Denver. Norman retired as a general partner of Lamber & Company, New York capital investment firm, to take the position. As a former vice president of Tennessee Gas Transmission Company of Houston, Norman also was president of Tennessee's subsidiary, Northeastern Gas Transmission Company.

•

B. B. Colley, Houston, assistant regional geologist for **Continental Oil Company's** southern area, has been promoted to assistant manager of the company's geological section. He will continue to make his headquarters in Houston. Colley joined Conoco at Houston in 1950 and two years later was promoted to assistant regional geologist for the company's southern area. Prior to joining Conoco, Colley spent 10 years as a geologist with another oil company in Colombia, South America.

•

The Ohio Oil Company has established a Research department to carry out a long range program of petroleum research. **W. H. Barlow,** presently assistant chief petroleum engineer, is named manager of the department. Barlow joined Phillips Petroleum Company upon graduation from Oklahoma University. He served as a petroleum engineer for the U. S. Bureau of Mines and then joined Ohio Oil at Tulsa in 1942. He moved to the general office in Findlay, Ohio, in 1945 as a member of the staff of the chief petroleum engineer and advanced in 1952 to assistant chief petroleum engineer.

W. H. Barlow

•

F. W. J. (Billy) Haas, the first man to open a Houston office for **Shell Oil Company,** has retired after almost 40 years service. For the past several years Haas has been in charge of drafting for Shell's technical services division.

•

Walter N. Bercaw, Standard Oil Company of Indiana, has retired as superintendent in the industrial relations division of the general office manufacturing department at Chicago. Bercaw, who joined Standard in 1917, will be replaced by **L. J. Frondin.**

•

W. C. Hawk, geologist of **Continental Oil Company,** has been promoted to manager of the company's geological section with headquarters at Houston. He has been central regional exploration manager at Oklahoma City. Hawk was assistant division geologist at Houston from 1948 to 1950 when he was transferred to Oklahoma City.

•

Dr. Frank H. Dickey, Berkeley, Calif., chemistry instructor at the University of California, has joined **Continental Oil Company** as a consultant in theoretical research. He will make his new headquarters at Ponca City.

To the many friends, associates and clients of Edgar Tobin, San Antonio, we extend our sincere appreciation for your messages and expressions of sympathy at his loss.

Edgar Tobin devoted most of his working life to the development of aerial mapping systems for the oil industry and to the mapping of a large area of the United States.

We consider it our duty to his memory—and to the many oil companies which have come to rely upon Tobin maps—to carry on this industry just as he would have done. We will continue to provide the oil industry with maps meeting the high standards of accuracy and reliability which he established.

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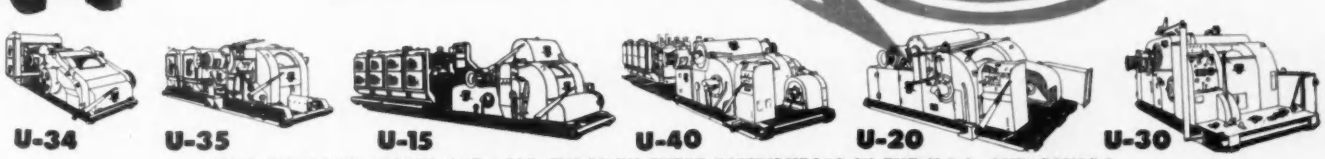

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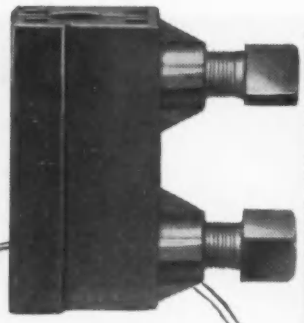

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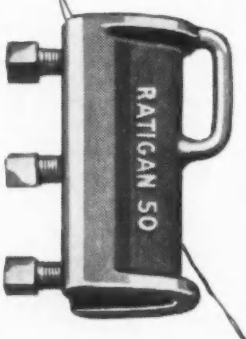

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C. P. Bristol, Shell Oil Company area manager at Tulsa, has been appointed vice president—Tulsa exploration and production area. Bristol received a degree in petroleum engineering from the University of Oklahoma and worked with Shell during summer vacations. Bristol started full time with the company in 1931 as a field engineer in the East Texas area and subsequently advanced through positions in the Production department. In 1944 Bristol became division manager in the East Texas area and three years later was appointed chief exploitation engineer at Houston. He became production manager at Houston in 1950 and moved to Tulsa in the same capacity in 1951. Bristol was appointed area manager at Tulsa last August.

C. P. Bristol

•

George H. Truran, Jr., of Bakersfield, Calif., has been promoted to superintendent of the Operating department of Tide Water Associated Oil's San Joaquin Valley area district. Truran replaces **Thomas E. Weaver,** Oildale, Calif., who has been transferred to the company's Los Angeles area with headquarters at Los Nietos, Calif., replacing **Frank C. Foster,** who retired. Truran, who will have headquarters at Oil Center, started with Tide Water in 1946 as a production engineer in the company's San Joaquin Valley district with headquarters at Oil Center and was made production foreman in March, 1949.

•

The Ohio Company has announced appointment of **Clayton L. Orn** as general attorney. Orn, formerly division attorney in Houston, moves to the general office at Findlay, Ohio, to assume the newly created position in the company's Legal department.

•

Lewis G. Weeks, has been appointed chief geologist of **Standard Oil Company (New Jersey).** Weeks has been the company's senior research geologist in the Production Coordination department. As chief geologist Weeks will continue as a member of the Exploration Division and will specialize in gelogical problems connected with the search for oil by Jersey Standard affiliates. He joined the Jersey Standard organization in South America in 1924 and became chief geologist of Standard Oil Company of Argentina in 1933. Later he was president of Standard Oil of Bolivia. Weeks transferred to New York as a senior staff geologist of Jersey Standard in 1938 and since then has specialized in world geology. In that post he has conducted pioneer research activities in his specialized fields of sedimentary basin development, oil occurrence and world oil reserves.

Lewis G. Weeks

H. M. Bayer has been elected a vice president of **Gulf Oil Corporation** and will be in charge of the company's Fort Worth Production Division succeeding **F. J. Adams,** who retired December 31. A veteran of 29 years with the Production Division of the Gulf companies, Bayer was manager of exploration in the company's Fort Worth Production Division prior to his recent election. A geologist by education and training, Bayer has knowledge of exploration, oil production and oil company administration.

H. M. Bayer

•

Standard Oil Company (New Jersey) has announced the appointment of **Alfred B. Hecker** as general auditor succeeding **W. H. Dickie,** who has retired after 40 years service with the company.

•

The Ohio Oil Company has advanced **L. P. Foote,** superintendent of the Markham, Texas, gas plant, to senior petroleum engineer in the company's general office in Findlay, Ohio. Foote's work will include the engineering phases of natural gas gathering lines and compressor installations and the design, construction and processes of gasoline, cycling and other plants handling gas produced in the company's oil and gas field operations. He will serve on the staff of the chief petroleum engineer.

•

Dr. Paul D. Foote, executive vice president and director of research, **Gulf Research & Development Company,** has retired after 26 years of service with the Gulf organization. In addition to his responsibilities with Gulf Research & Development Company, Dr. Foote also will relinquish his duties as a vice president of Gulf Oil Corporation and Gulf Refining Company. Foote joined the Gulf organization in 1927 as senior fellow of the Gulf Fellowship at the Mellon Institute of Industrial Research in Pittsburgh, and during the next two years, organized a coordinated program of research dealing with the production and transportation of petroleum. This program served as the nucleus for the present-day Gulf Research & Development Company, which was established in 1933 with Foote as executive vice president and director of research. In 1945 he was elected vice president of Gulf Oil and Gulf Refining.

•

Housh Drilling Company has announced the association of **Jarvis Garst** as geologist with the firm and other Housh enterprises. A graduate of The University of Texas, Garst was employed by Continental Oil Company in Mexico for several years, then went with Plymouth Oil Company in South Texas as district geologist. The next few years were spent with Union Oil Company as district geologist in Houston and later in Jackson, Miss. During the past five years Garst has been in Jackson as division geologist for Honolulu Oil Corporation.

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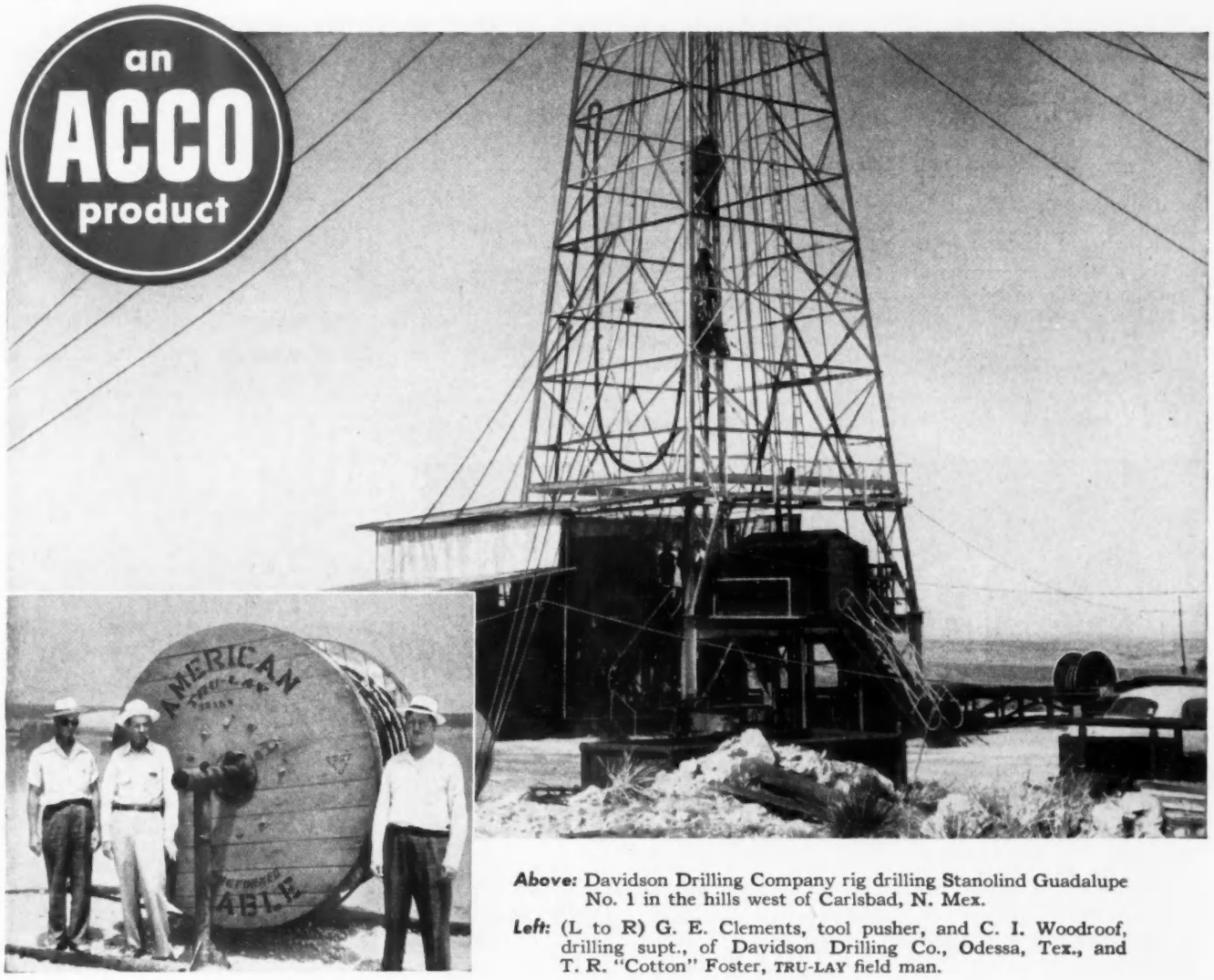

Above: Davidson Drilling Company rig drilling Stanolind Guadalupe No. 1 in the hills west of Carlsbad, N. Mex.

Left: (L to R) G. E. Clements, tool pusher, and C. I. Woodroof, drilling supt., of Davidson Drilling Co., Odessa, Tex., and T. R. "Cotton" Foster, TRU-LAY field man.

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Philip S. Justice has been appointed general manager of **Sun Oil Company's** Rocky Mountain Production Division with headquarters at Denver and **Donelson Caffery** was appointed general manager of the Gulf Coast Division. **Joiner Cartwright** has been given increased responsibilities as general counsel of the division and will continue as an assistant secretary of the company. Justice succeeds **J. E. Regent**, who is recovering from an illness. Regent will return to his former home in Dallas as special assistant to the management of the Southwest Division.

•

J. B. Anderson, formerly regional geologist for **Continental Oil Company**, Los Angeles, has resigned to accept the position of senior geologist with **Kern Oil Company, Ltd.**, with headquarters in Los Angeles.

•

Harry Blackstock, Jr., drilling superintendent for **Dirickson & Lewis**, has joined **Schafer Drilling Company**, Oklahoma City, as assistant drilling superintendent.

•

R. J. Irvin, vice president and sales manager of **Seaside Oil Company**, has assumed the position of general manager. His assignment follows the appointment of **Harry A. Jackson**, president of Seaside, to vice president of the Eastern Division of **Tide Water Associated Oil Company** in New York. Irvin began his career in 1921 with Tide Water in the Bay area as service station attendant. He has been vice president and sales manager since 1947.

Guy Waddington

D. B. Taliaferro

Guy Waddington and **D. B. Taliaferro**, engaged in research at the Petroleum Experiment Station of the Bureau of Mines, Bartlesville, Okla., have received the highest honor of the Department of the Interior, the Distinguished Service Award with its accompanying gold metal. Taliaferro, who has more than 25 years of government service, is in charge of the Secondary Recovery Branch of the Bartlesville Petroleum Experiment Station. Recognition came to him because of his assistance to the industry in bringing about a better realization of the need for applying stimulative methods to extract greater quantities of oil from partly depleted fields. Waddington's award comes in recognition of outstanding contributions to science as a physical chemist and for leadership as chief of the Thermodynamics Branch of the Petroleum Experiment Station at Bartlesville.

•

Harold G. Teverbaugh has been appointed assistant manager of the Gas Division of **Texas Natural Gasoline Corporation.** Teverbaugh resigned his position as project engineer with Sunray Oil Corporation to accept his new duties with Texas Natural. Teverbaugh was associated with Stanolind Oil and Gas Company as junior engineer before joining Sunray in 1948 as field engineer at the Benton Cycling Plant in Benton, La. Teverbaugh was promoted to plant engineer and later to plant superintendent. He accepted the position of project engineer in 1950, transferred to Tulsa office of Sunray.

H. G. Teverbaugh

•

John L. Ferguson, Tulsa geologist, has resigned his position as vice president of **Deep Rock Oil Corporation**, and is entering the consulting field, specializing in exploration problems. Ferguson, who studied at Darmouth and Harvard, joined a Canadian geological survey party in Nova Scotia as field assistant in 1914. He worked as assistant in physiography at Harvard, then joined Charles N. Gould and Associates in Oklahoma City in 1917 to do mapping work in Texas and Oklahoma as field geologist. After service in World War I, Ferguson renewed his association with Gould and joined Borealis Oil Company of Oklahoma City as a geologist in 1922. Later he became associated with Amerada as district geologist and later began work in the field of correlating seismic and geological information.

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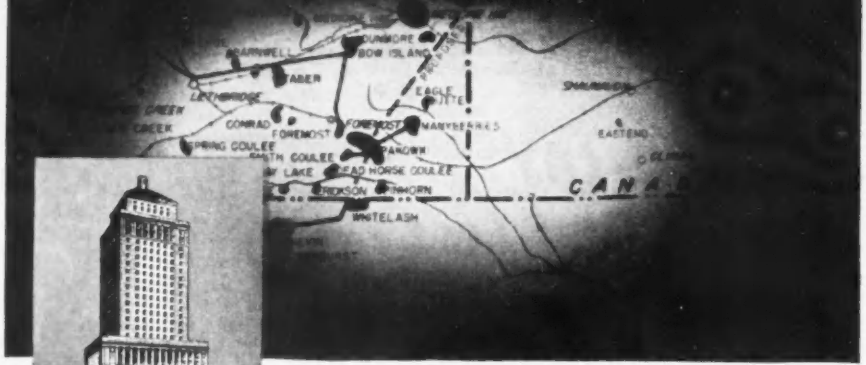

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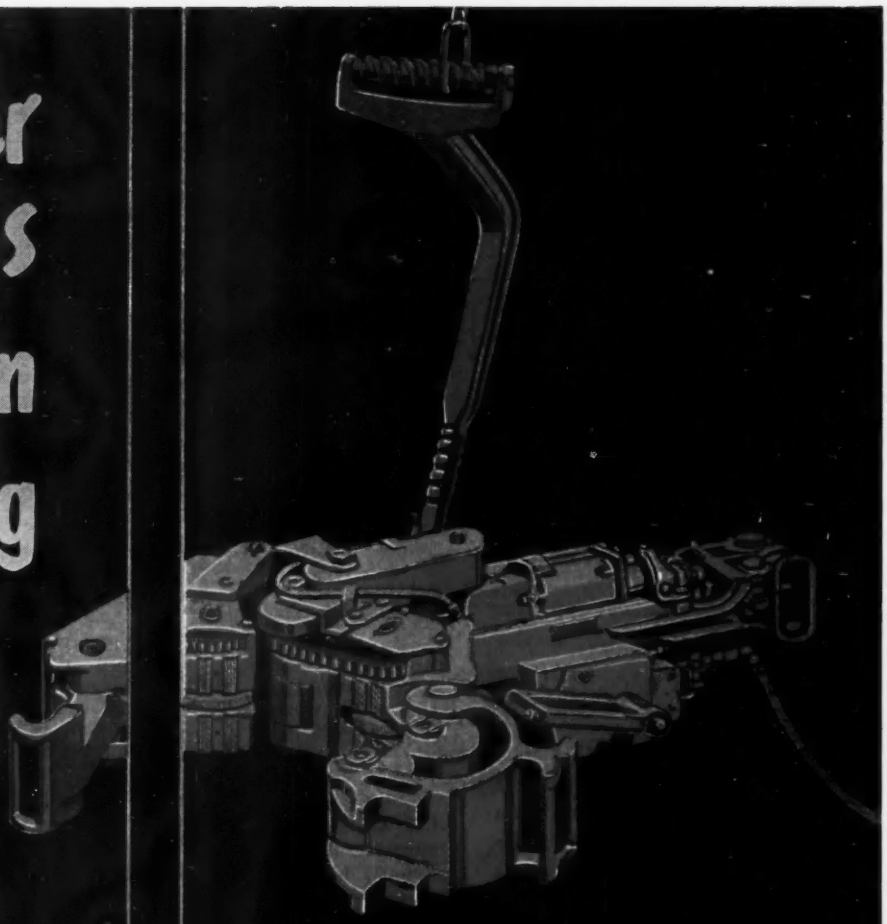

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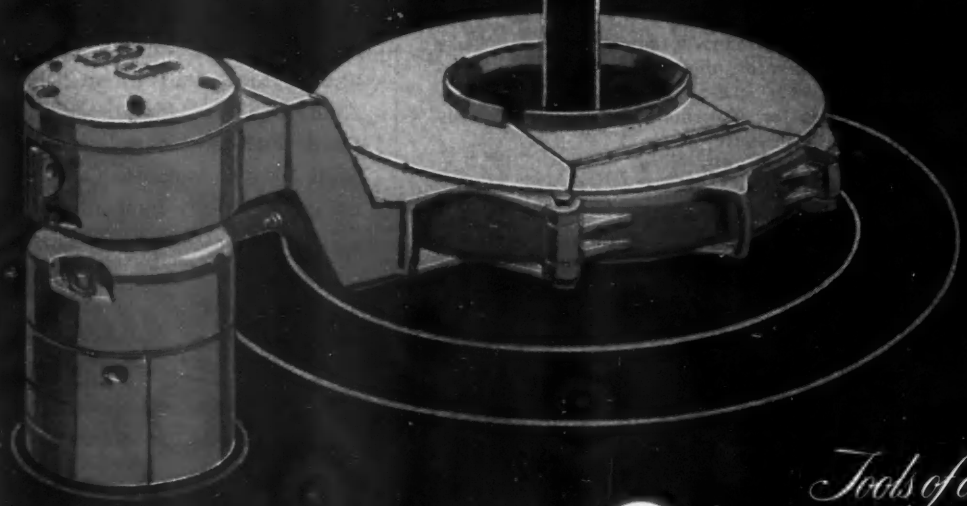

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DEATHS

Addison F. Holliday, former vice president and director of Plymouth and Big Lake Oil companies and former president of Hiawatha Oil and Gas Company and Penn-Ohio Gas Company, died January 15 in Pittsburgh. The 79-year-old oil and gas pioneer retired in 1952, ending a 61-year career which began with Senator William Flinn in 1891. He was associated with his uncle, Addison B. Dally, Jr., in the Wheeling Natural Gas Company, organized by Senator Flinn. In 1922 the Senator's companies were taken over by famed wildcatter, M. L. Benedum, and from that date Holliday was associated with the Benedum interests.

•

Benjamin Joseph Harper, 84, who drilled in the second gusher well at Spindletop field near Beaumont in Gulf Texas in 1901, died in Dallas.

•

Robert M. Bass, 56, oil drilling contractor in Kilgore, Texas, died January 12 in Dallas. Previously he was employed by the Sinclair-Prairie Oil and Gas Co. until its consolidation with the Sinclair Oil and Gas Co. in 1940.

•

Lee Cady, 88-year-old former Tulsa oil operator, died January 13 at his home in Pampa, Texas.

•

Joseph R. McGraw, 53, of Tulsa, president of McGraw Oil Company and Associated Petroleum Properties, Inc., died January 21 in Rochester, Minn. He was a native of Ponca City, Okla., and at one time was associated with the former Marland Oil Company.

•

John H. Irwin, 57, Skelly Oil Company executive, died January 20 in Tulsa. Employed by the Skelly firm for the past 22 years, Irwin was assistant division manager for retail sales for the company for 18 years.

•

L. R. Chalmers, former independent Tulsa oil operator, died January 13 in Muskogee. He had been an oil operator in Tulsa for 20 years until moving to Muskogee in 1940.

•

Dr. Dan W. Ohern, former head of the University of Oklahoma geology department, died December 27 in Oklahoma City. Dr. Ohern had been in the oil business for 40 years.

•

William Henry (Barney) Cleveland, 73, retired tax supervisor for the Tide Water Associated Oil Company, died December 20. Cleveland retired in 1950 after working 30 years for the Tide Water firm and its predecessor, the Tidal Oil Company, and had been a public accountant and tax counselor since retirement.

•

Michael E. McKeever, 86, pioneer Tulsa drilling contractor, died December 25 in Tulsa. McKeever came to Tulsa in 1903 as general superintendent for the old Guffey and Galey Oil Company, which later merged with the Barnsdall Oil Company. Later he became an independent oil field driller.

•

Ray G. Hardesty, 64, employe of the Accounting department of Gulf Oil Corporation, died in Tulsa December 23.

•

Alexander Taylor, 80, retired oil driller and pioneer Dewey, Okla., resident, died December 9.

•

Robert Anthony Josey, 83, pioneer Texas and Oklahoma oilman, died January 31 in Houston. Josey, who began his career at Spindletop is said to have drilled the second well in the Spindletop field. At the time of his death, Josey was president of R. A. Josey, Inc., the Gem Oil Company and Midwest Production Company.

•

Paul Williams, 60 year old Oklahoma City oilman, died January 30 in Oklahoma City.

•

Roy E Anderson, veteran oil producer of Shreveport, died while on a business trip to Mobile, Ala. Before becoming an independent operator, Anderson was with The Texas Company.

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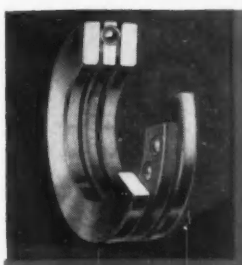
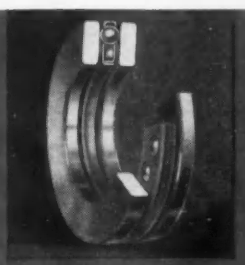
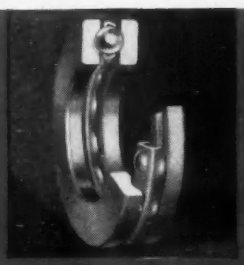


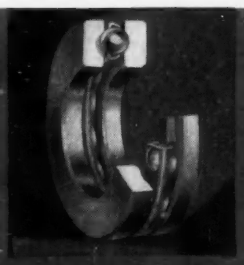
A SERIES • Light duty, one direction ball thrust bearing. Flat seat. Flat races. Bronze ball retainer . . . 38 sizes ½" to 3½" I.D.



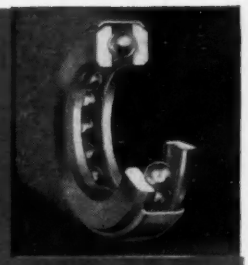
C SERIES • Light duty, one direction ball thrust bearing. Flat seat. Flat races. Pressed steel retainer . . . 16 sizes ½" to 1⅞" I.D.



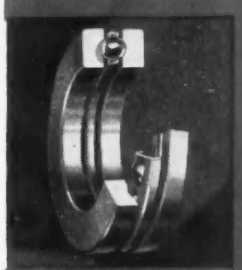
F SERIES • Light duty, one direction thrust bearing. Flat seat. Grooved races. Pressed steel retainer . . . 43 sizes ½" to 3½" I.D.



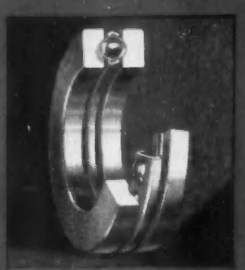
G SERIES • Medium duty ball thrust bearing. Grooved races. Pressed steel or bronze (large sizes) retainer . . . 76 sizes ½" to 7⅝" I.D.



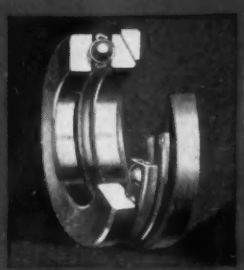
E SERIES • Medium duty ball thrust bearing. Banded. Flat seat. Grooved races. Full complement of balls . . . 40 sizes ½" to 3½" I.D.



1000 SERIES • Light duty ball thrust bearing. Flat seat. Grooved races. Pressed steel retainer. Metric standard . . . 26 sizes 10 to 125 mm. I.D.

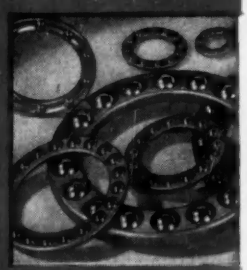


1100 SERIES • Medium duty ball thrust bearing. Grooved races. Pressed steel or bronze (large sizes) retainer . . . 23 metric sizes 10 to 140 mm. I.D.



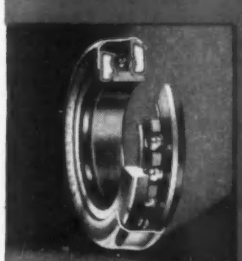
1400 SERIES • Medium duty. Grooved races. Spherical seat. Pressed steel or bronze (large sizes) retainer . . . 23 metric sizes 10 to 140 mm. I.D.

W SERIES • Case hardened and ground flat washers for various Thrust and Spacer applications. Slip fit. 38 sizes ½" to 3½" I.D.



R SERIES • Ball thrust retainer. One piece, pressed steel, channel type cage . . . 79 inch sizes 0.266" to 4.232" I.D.

Judged by every quality and performance standard Aetna bearings measure up to modern industry's increasingly exacting needs. That's why Aetna has a customer list that reads like Who's Who in American Industry—why 80% of Aetna's business comes from firms it has served for 20 or more years. Aetna has specialized on the advanced development, production and application of high precision anti-friction products for nearly four decades. Be sure to give this valuable background of experience your serious consideration when planning improvements of your present products or developing new ones for future production. We welcome your inquiry.



CLUTCH BEARINGS • Ball thrust clutch release bearing. Banded. Pre-lubricated. T-type, all impregnated bronze retainer assures concentricity and smooth, quiet, long-life performance.

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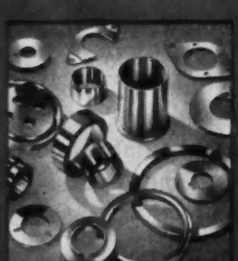


PRECISION PARTS • Aetna is versatile—can mass-produce vital parts in almost limitless sizes and shapes—to your most exacting metallurgical, tolerance and finish specifications.

Write for latest catalog. Contains specifications on Aetna's complete line—vital technical reference data on bearing selection, load capacities, lubrication, care and maintenance.

Companies in the News

FALCON SEABOARD DRILLING COMPANY has announced sale of approximately $1 million worth of newly-issued stock to finance expansion of the company's operations. **T. N. Law**, president of Falcon Seaboard, announced the purchase of the stock by Fox Wells and Company, private investment firm. **Heywood Fox** and **Roger H. Weed** of the investing firm will be elected to the Falcon Seaboard board of directors. The present board consists of **Law, C. W. Alcorn**, executive vice president of the Gulf Coast division; and **J. L. Stauss**, executive vice president of the Mid-Continent division and treasurer.

•

NORTHERN NATURAL GAS PRODUCING COMPANY has opened a new district office in Wichita, Kansas, at 502 Rule Building. The Wichita office of the company will supervise all exploration and producing activities for the company in Oklahoma, Kansas and the eastern two-thirds of Nebraska. **L. B. Fugitt** is district geologist in charge of the office. Formerly he was in the company's Amarillo, Texas, office, which has now been closed. Other personnel in the Wichita office are **R. V. Moore**, formerly geologist at the company's Bismarck, N. D., office and **B. J. Parker**, district landman.

•

OLDS OIL CORPORATION, Casper, Wyo., contract oil well driller, is being merged into **GREAT LAKES OIL & CHEMICAL COMPANY**, following acquisition of the outstanding minority interest. Control of Olds was acquired by Great Lakes in December, 1951, and has since been operated as a partially-owned subsidiary.

•

George O. Baird, Jr., Shreveport independent oil operator, and Mark V. Marlowe, Kentucky coal operator, have organized the **MARLOWE PETROLEUM COMPANY**, which will operate over the mid-continent area. The company will be engaged in the purchase of leases, royalties, drilling blocks and furnishing development capital in the Shreveport area. Headquarters have been established in the Gidden-Lane Building in Shreveport.

•

CHANSLOR-CANFIELD MIDWAY OIL COMPANY has merged into **CHANSLOR-WESTERN OIL AND DEVELOPMENT COMPANY**, a Delaware corporation. Chanslor-Western Oil and Development Company has succeeded to all of the assets and assumed the liabilities of Chanslor-Canfield Midway Oil Company. After the close of business December 31, 1953, the business formerly carried on by Chanslor-Canfield Midway Oil Company is being carried on as the Chanslor-Canfield Midway Division of Chanslor-Western Oil and Development Company.

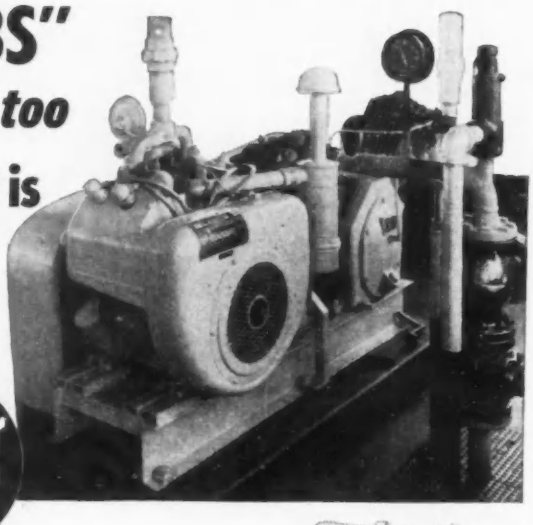
•

THOMPSON-CARR, INC., has announced the change in name of the corporation to **A. W. THOMPSON, INC.** Officials of the firm are **A. W. Thompson**, Houston, president; **F. L. Thompson**, Midland, Texas, vice president; **John Campbell**, Houston, secretary-treasurer; and **K. L. Beck**, Odessa, Texas, general superintendent; **Harry Woodward**, Odessa, assistant superintendent; and **Paul D. Shaffer**, Odessa, chief engineer.

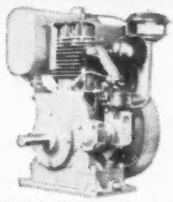
•

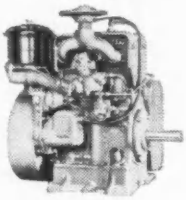
HARRY NOWLAN & ASSOCIATES, INC., in Evansville, Ind., announces the change of name to **NOWLAN-DODSON ENGINEERING, INC.**, specializing in estimate of reserves for bank loans, purchases, sales, etc.; secondary recovery, reservoir analysis, plant design, engineering supervision of waterflood projects; and natural gas engineering, design of gas storage reservoirs.

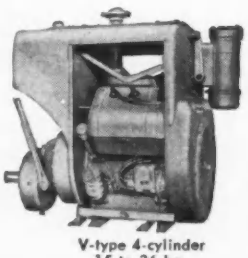
"INSIDE JOBS"
Are Important, too
This Compressor is WISCONSIN-POWERED



Power TO FIT THE JOB
Power TO FIT THE MACHINE


4-cycle Single Cylinder 3 to 9 hp.


2-cylinder 7 to 15 hp.


V-type 4-cylinder 15 to 36 hp.

Typical of the "Inside Jobs" handled by Wisconsin Heavy-Duty Air-Cooled Engines in the oil field is this air-compressor application in a Texas pipe-line pump station.

Wherever constant, steady-going power is required, inside or outside, you can depend on Wisconsin Heavy-Duty Air-Cooled Engines to stay on the job and fully meet the power demands of the assignment. Dependable AIR-COOLING makes these engines weather-proof and fool-proof. Heavy-duty design and construction adapt them to the toughest operating conditions. They not only fit the equipment and the job, but they also fit your available fuels . . . gasoline, kerosene, casing-head gas, butane or propane.

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and others

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What's Happening

AMONG INDUSTRY ASSOCIATIONS

Well Completion Symposium Held

More than 1400 oil men gathered on the University of Houston's campus January 12 to participate in a symposium on permanent type well completions sponsored jointly by the Gulf Coast Section, AIME, and the University's Department of Petroleum Engineering.

Pacific Chapter AIME Plans Year's Program

Plans for the year were initiated recently by the Pacific Petroleum Chapter AIME. M. E. Loy, Schlumberger Well Surveying Corp., assumed duties as chapter chairman, taking over from F. Lowry Wadsworth of General Petroleum Corp. Left to right, seated, are Kemp Barley, Baroid Sales Division, councilor; Loy and Wadsworth; J. S. Bell, Humble Oil & Refining Company, councilor. Standing are R. S. Crog, California Research Corporation, 1953 chairman of petroleum technology committee; Phil C. Cook, Union Oil Company, chairman of membership directory committee; C. R. Dodson of Stanley, Stolz and Dodson, outgoing vice chairman; Hal Stanier, Sunray Oil Corporation, councilor; Nick Van Wingen, consultant 1953 senior past chairman; J. A. Klotz, California Research Corp., secretary; and J. S. Baker, treasurer and councilor.

AGA Gas Supply Conference To Be Held March 4 and 5

A calendar of natural gas subjects has been planned for the second A.G.A. gas supply, transmission and storage conference to be held in New Orleans, March 4 and 5. The conference is sponsored by the operating section of the American Gas Association and in some measure will replace the former spring conference of the Natural Gas Department of A.G.A.

Among the subjects to be covered are communications, compressor stations, large volume gas measurement, pipe lines and underground storage, dehydration, dispatching, natural gas production and pipe line construction

Subjects ranging from relations with the FCC to training for executive positions will be covered on the programs of the general sessions by speakers from within the industry and from educational, financial and business fields outside the industry.

API Production Meeting Program Announced

Plans for the Mid-Continent District of the Division of Production, API, have been announced by F. H Willibrand, chairman, general arrangements committee, and Jack Abernathy, API chairman of the Mid-Continent district. The meeting is slated for March 17-19 at the Biltmore Hotel, Oklahoma City.

Speakers at the March 18 general session will be Drew M. Young, The Atlantic Refining Company, Dallas, "Supervisory Development on a Day-to-Day Basis"; Hal C. Thompson, E. I. du Pont de Nemours Company, Wilmington, Del., demonstration of the "Magic Barrel"; and Frank M. Porter, president of API.

F. H. Willibrand, Sohio Petroleum Company, Oklahoma City, and Fred Neslage, West Pampa Repressuring Association, Pampa, will preside at the general session. Group sessions will be held March 18 and 19.

Petroleum Council Membership Announced

The 1954 membership of the National Petroleum Council, an advisory body representing the petroleum industry in the United States, has been announced.

All but four of the persons appointed for 1954 were members of the 1953 council and 37 on the new roster have served on the NPC since it was established in 1946. New members for 1954 are D. K. Ludwig, president, National Bulk Carriers, Inc., New York; W. A. Moncrief, Fort Worth; John Ruan, president of the National Tank Truck Carriers, Inc.; and Sidney A. Swensrud, Gulf Oil Corporation, Pittsburgh.

Retiring members are William R. Boyd, Jr., of Boyd, Hardey and Wheelock, Teague, Texas; Col. J. Frank Drake, Gulf Oil Corporation, Pittsburgh; E. DeGolyer, DeGolyer and MacNaughton, Dallas; and R. S. Shannon, Pioneer Oil Corporation, Denver.

Oil Production Pioneers Elect New Officers

G. S. Follansbee, Jr., Universal Consolidated Oil Company, was elected president of the Petroleum Production Pioneers by the board of directors at the annual meeting in Los Angeles.

Others elected to office were R. R. Von Hagen, Lloyd Corporation, vice president; T. J. Hickey, Jr., Hickey Pipe & Supply Company, treasurer; Paul Andrews, Signal Oil & Gas Company, re-elected historian; and James D. Hughes, Lane Wells Company, sergeant-at-arms.

F. C. Ripley, Sr., CCMO Company, retired, was elected honorary president and A. L. Tietze, Standard Oil Company of California, retired, was elected honorary vice president.

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● Just as above ground you "crack the valve" to ease pressure release, the Johnston Hydraulic Tester eases the pressure change during drill stem tests. Opening in stages during two to four minutes eliminates shock to formation, pipe and instruments.

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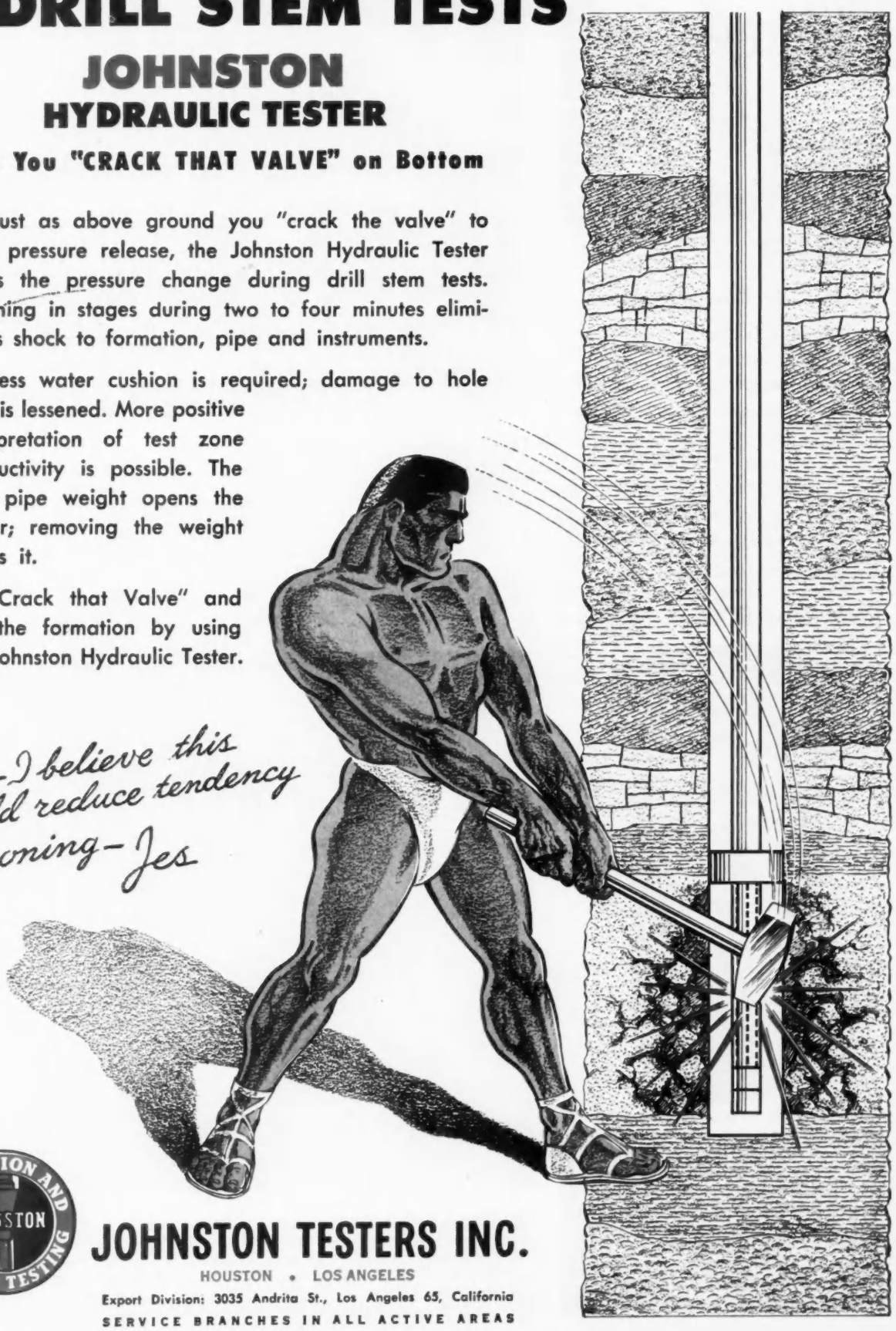

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OIIC Awards Presented

The first OIIC gold and silver awards to be presented were given by the Gulf Southwest District in Shreveport, La. The plan is to honor outstanding oilmen and women in the program. A total of 7 gold and 17 silver awards were made in the district. Receiving silver awards were, seated left to right, Grady Rea, Humble Oil & Refining Company, Paris, Texas; W. N. Blanton, Blanton Drilling Company, Houston; R. L. Goad, Gulf Refining Company, Mobile, Ala.; E. J. Reynolds, Standard of Kentucky, Jackson, Miss.; E. H. Simpson, jobber, Jackson. Standing, W. B. Cotten, Jr., Esso, Baton Rouge, La.; A. H. McHarg, The California Company, New Orleans; J. Tonnie Pegue, Standard of Texas dealer, Albuquerque, N. M.; T. F. Cramer, Gulf Refining Company, Shreveport; H. J. Nicholas, Gulf, Jackson; and J. P. Scott, The Texas Company, Jackson.

Drilling Contractors at Barbecue

Among the approximately 1000 who attended the barbecue given in connection with the AAODC South Louisiana safety clinic at New Iberia, La., recently were O. H. Poe, Loffland Brothers; W. B. Stuard, Southern Production Company; J. W. Williams, Falcon Seaboard Drilling Company; K. R. Simmons, Nicklos Drilling Company; and R. N. Meyers, Shell Oil Company. The half-day meeting included demonstrations and movies.

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WRIGHT CREW inserting neoprene packing rubber in drilling head.

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"Out here in West Texas and over in New Mexico, the Yates Gas Sand shows relatively high pressures at shallow depths. Frequently on clean-out jobs, we encounter high pressure and must handle it *quickly* and *safely*. That's when it's good to know you can count on the rugged strength of the neoprene packing element!"

Such remarks are frequently heard around drilling rigs. For the men on the job know it pays to specify NEOPRENE in packers and protectors, in strippers and piston rubbers . . . in fact, in any rubber product that must take severe punishment and be ready for more!

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Montana Chapter AIME Is Organized Recently

A Montana chapter of the AIME to be named the Billings Petroleum Section of AIME has been organized in Billings, Mont.

Officers elected for the group include Howard R. Lowe, Delhi Oil Corporation, chairman; Charles F. Hunkins, N. P. Oil Development, first vice chairman; R. L. Dickson, Dowell Incorporated, second vice chairman; and John G. Yapuncich, Yapunchic-Sanderson Laboratories, secretary-treasurer. Three members elected to the board of directors were J. J. Wanner, George J. Greer, Trustee; R. H. Woodward, Shell Oil Company; and Earl J. Whitaker, N. P. Oil Development.

Equipment Suppliers Plan Membership Meeting

The Petroleum Equipment Suppliers Association, Pacific District, will have a spring membership meeting March 24 at the Ambassador Hotel, Los Angeles. The meeting will be followed by cocktails and dinner.

Executives of the oil industry and drilling contractors will speak on the program. Davis D. Bovaird, president of Bovaird Supply Company, Tulsa, and president of the association, will attend.

Kansas Oil Men Name Board of Directors

Six members of the Kansas Oil Men's Association were named to the board of directors at the end of the association's thirty-ninth annual convention attended by 400 members.

Chosen as directors were William B. Dalton, Kansas Oil Company, Topeka; A. F. Geyer, Dixie Oil Company, Waterville; M. K. Grigg, Scott City Oil Company, Scott City; William L. Kistler, Kistler Oil Company, Coffeyville; William L. Oswald, O. K. Service Company, Hutchinson; and R. V. Broman, Broman Oil Company, Salina.

Pew Named Chairman Of Gas Promotion Group

James E. Pew, manager of the natural gas and natural gasoline department of Sun Oil Company, Philadelphia, was elected chairman of the National Committee for LP-Gas Promotion in Chicago recently. He succeeds Lee A. Brand, vice president of Empire Stove Company, Belleville, Ill., who has held the post since February, 1950.

James E. Pew

A new name for the organization, National Council for LP-Gas Promotion, was adopted. K. R. D. Wolfe, vice president, Fisher Governor Company, became chairman of a newly-constituted executive committee. Serving with him will be three LP-Gas marketers and three other members representing the LP-Gas production, appliance and equipment branches of the industry.

Photogrammetry Society Elects New Officers

Arthur C. Lundahl, Bethesda, Md., was installed as president of the American Society of Photogrammetry recently in Washington, D. C. Other new officers of the aerial mapping organization are W. Sidney Park, Louisville, Ky., first vice-president, and Robert H. Colwell, Walnut Creek, Calif., second vice-president.

Five new directors elected were Donald J. Belcher, Ithaca, N. Y.; William E. Harman, Jr., Arlington, Va.; Albert L. Nowicki, Washington, D. C.; Eldon D. Sewell, Dayton, Ohio, and Dr. Francis E. Washer, Bethesda. C. Earl Palmer continues as secretary and T. W. Norcross as editor of the quarterly journal, "Photogrammetric Engineering."

Ohio OIIC Elects Blackham Chairman

D. B. Blackham, manager of Sun Oil Company's Cleveland District, has been elected chairman of the Ohio Oil Industry Information Committee for 1954-1955. Elected by a recent vote of all Ohio committeemen, Blackham succeeds M. A. Baur of Socony-Vacuum.

Named as executive vice-chairman was R. D. Robinson, assistant district manager for sales for Ohio Oil Company at Findlay. During 1954, this industry-wide public information program will emphasize expanding membership and participation by local oil men, and broader application of the industry's program for high schools, civic clubs and other organizations.

TK-2 LINING PROTECTS

7 MILLION FEET

OF OIL COUNTRY PIPE

AGAINST PARAFFIN or CORROSION

In 10 years, the busy Tube-Kote plant has applied its field-proven TK-2 plastic lining to 7 million feet of tubing for producers, pipe lines, drillers, refineries, and chemical plants.

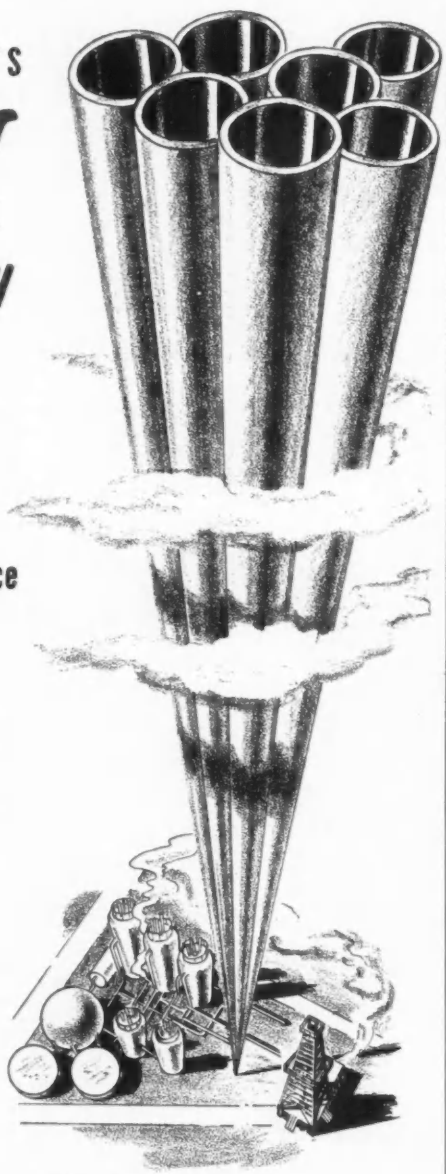
It Can End YOUR Paraffin Nuisance and Corrosion Troubles

TK-2 ends paraffin accumulation in producing wells. It resists corrosion in wells where ordinary pipe is damaged by gas condensate or sour crude. It is especially practical for wells on packer, high pressure wells, offshore or isolated wells, and for wells with storm chokes. In process and chemical plants it stands up under severe, corrosive conditions.

Pays its way quickly!

Case histories show that initial cost is saved many times over when pipe is lined with TK-2. Save pipe, save down-time, save replacement labor.

TUBE-KOTE, INC.
P. O. Box 20037 • Houston 25, Texas



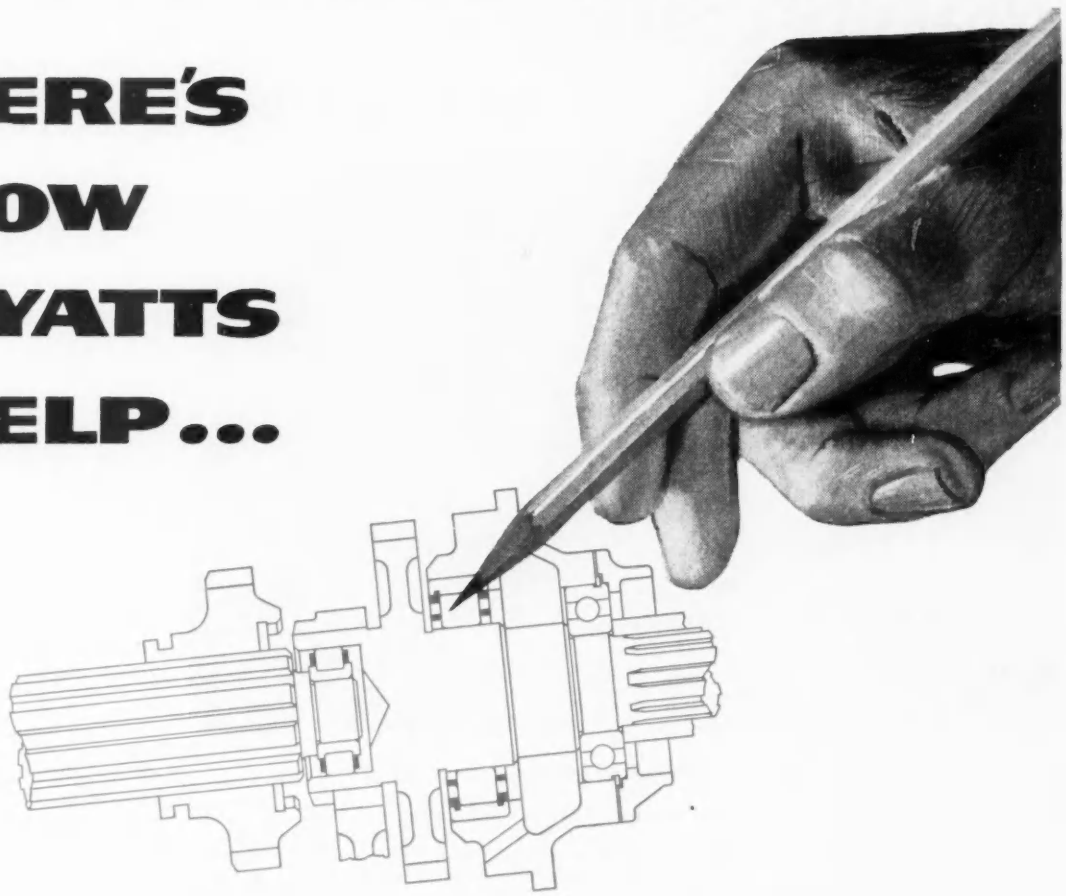
Write today for free engineering data on Tube-Kote linings.

TUBE-KOTE
First Name In Corrosion Resistance

TUBE-KOTE T.M. Reg.

when LIMITED SPACE is a design factor

HERE'S HOW HYATTS HELP...



Sometimes a fraction of an inch is the difference between a simple design modification and costly re-tooling. And the engineer who is thoroughly familiar with Hyatt Roller Bearings will know a lot about how to save those fractions. He'll know, for example, that to gain greater shaft rigidity with the same size housing, he need only check his Hyatt catalog for a separable inner race type of bearing. This type—available in a wide range of sizes—may be applied with the rollers operating directly upon the surface of a suitably hardened and ground shaft. Thus, a larger-diameter shaft may be used without sacrificing bearing capacity, or a larger-size bearing may be used without changing the size of the shaft. For a copy of Hyatt's latest catalog, No. 150, write to Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER

What's Happening

AMONG SERVICE AND SUPPLY MEN

Caterpillar to Celebrate 50th Anniversary

Louis B. Neumiller, left, president of Caterpillar Tractor Company, and H. S. Eberhard, executive vice president, unveil a medallion representing the theme for a commemorative program Caterpillar will conduct in 1954 celebrating the 50th anniversary of the world's first practical track-type tractor. The Holt Manufacturing Company, one of Caterpillar's parent companies, successfully tested the first practical crawler on Nov. 24, 1904 in Stockton, Calif. About this time the trademark Caterpillar was originated by the Holt company.

Parkersburg-Aetna Corporation To Conduct Combined Operations

The merger of The Parkersburg Rig and Reel Company and Aetna Ball & Roller Bearing Company became effective February 1 and the combined operation formally took Parkersburg-Aetna Corporation as its new name.

A. Sidney Knowles, formerly chairman and president of Parkersburg, will be chairman of the board of the merged corporation, and William A. Wood, Aetna president and treasurer, will hold the same offices in the organization. Knowles and Wood will be the chief executive officers of the merged corporation.

Additional officers include W. V. Rathbone, vice president; J. J. Rozner, vice president; A. G. Evans-Lombe, vice president; Paul O. Summers, secretary; E. A. Johnson, assistant secretary and assistant treasurer, and Harold N. Wilson, assistant treasurer.

Parkersburg's plant facilities are located in Parkersburg, W. Va.; Coffeyville, Kansas; Houston; and Pomeroy, Ohio, the latter a foundry. Aetna's plant is in Chicago.

G. M. Cheatham Purchases Maloney-Crawford of Canada

Maloney-Crawford Tank & Manufacturing Company has sold the physical assets of its Canadian subsidiary, Maloney-Crawford of Canada, Ltd. to George M. Cheatham of Calgary, Alberta.

Cheatham, who has been vice president of Maloney-Crawford of Canada, Ltd., has formed a new company, Maloney-Crawford Tank & Service Company, Ltd. to serve as distributor of Maloney-Crawford tank, separator and treater product lines.

Headquarters will be at Edmonton.

Jones & Laughlin Announces Organizational Changes

Several organizational changes have been announced by the Jones & Laughlin Steel Corporation—Supply Division.

The Dallas-Fort Worth sales office is to be divided, each being a separate sales office. Guy A. McDaniel will be manager of the Dallas office and R. Z. Dallas will be manager of the Fort Worth office. Frank J. Kopp, formerly manager of the combined office, will continue his headquarters in Dallas and will handle special assignments from the Tulsa offices of the Division.

A sales office is being established in San Antonio, with John W. Kaye as manager. The district office of the Southwest Texas district is to be located at Corpus Christi, Texas, with Vance H. Weldon, Jr., as district sales manager.

New headquarters of the North Rocky Mountain District will be at Billings, Mont., and M. A. Park will continue as district sales manager.

The district office of the South Rocky Mountain District will be located in Denver, and Doyne Carson will continue as district sales manager.

Dunham, Ellis Retire From Hercules Powder Company

Russell H. Dunham, first president and former chairman of the board of directors, and William R. Ellis, vice president and board member, have retired from active service with Hercules Powder Company.

Dunham completed 51 years of service with the company. He will remain a member of the company's board of directors and finance committee. He took office as president in October, 1912, when the company was incorporated. He continued as president until March, 1939, and also as chairman of the board until 1944. He was elected chairman of the finance committee in 1939, a post he held until last year.

Ellis was general manager of the Explosives department during World War II and directed the operation of six government-owned plants for the manufacture of war munitions in addition to the company's own explosives operation. He became associated with Hercules in 1915 as a member of the explosives department sales and service division in San Francisco. In 1936 he was appointed general manager of the Explosives department and a year later became a company director. He was elected vice president in 1945 and served on the executive committee from 1945 to 1953.

National Cylinder Gas Company Announces Corporate Changes

National Cylinder Gas Company has simplified its corporate structure. Two of four wholly-owned subsidiaries now operate as divisions and the corporate charters of the remaining two have been surrendered and their operations taken over by the parent company.

Tube Turns, Inc. has become the Tube Turns division. Pennsylvania Forge Corporation has become a division known as Pennsylvania Forge Company. The Hollup Corporation of Chicago, and National Cylinder Gas Company—Pacific Coast, have been dissolved.

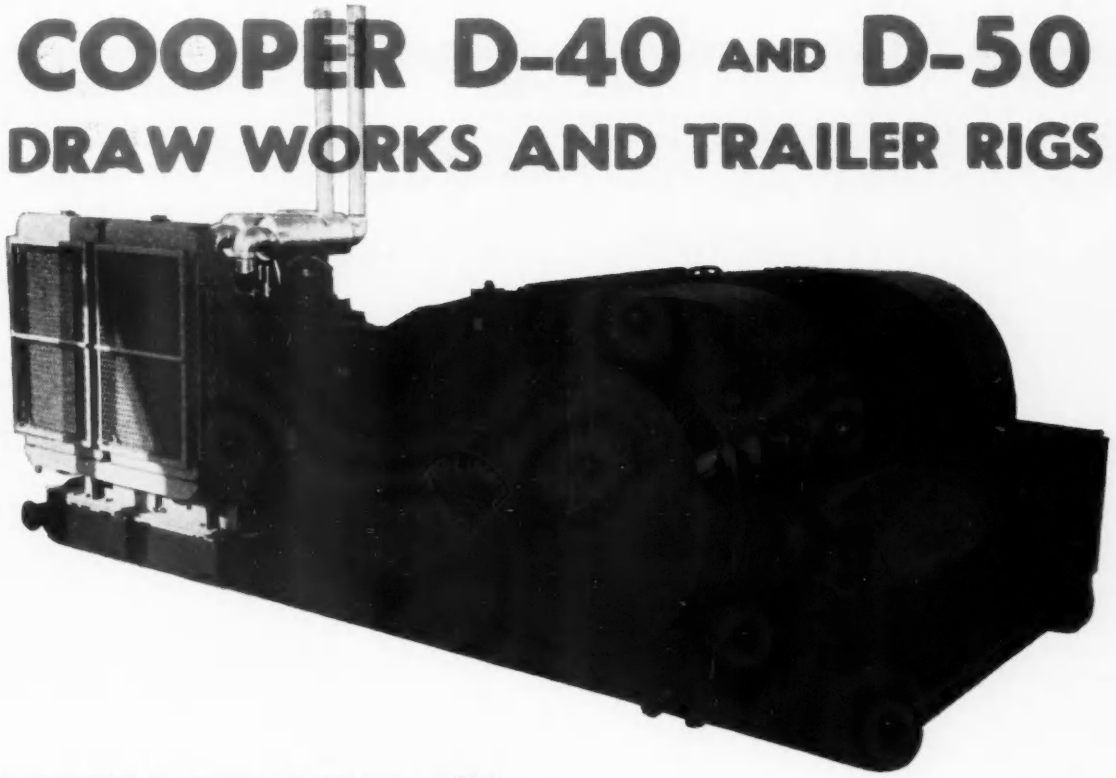
There will be no changes in the organization or method of operation of either Tube Turns or Pennsylvania Forge Company.

Klein Named Vice President At Allis-Chalmers Division

William J. Klein, manager of the Minneapolis branch, Tractor Division, Allis-Chalmers Mfg. Co., has been named vice president and general sales manager of the Tractor Division.

Klein started his career with Allis-Chalmers as a salesman in 1928 at the Sioux Falls, S. D., branch. Later he became a blockman in the northwestern part of South Dakota with headquarters at Mobridge. In November, 1929 he was made a special factory representative and in November, 1930, opened the company's Minneapolis branch.

COOPER D-40 AND D-50
DRAW WORKS AND TRAILER RIGS



D-50 DRAW WORKS for Rotary Drilling to 5,000 ft. With 4½" Drill Pipe. Rotary Workover and Servicing the Deepest Wells.

Brakes: 52" dia. x 10" face to handle the heaviest loads safely.

Powered by diesel or gas engine up to 400 horsepower.

D-40 DRAW WORKS for Rotary Drilling to 4,500 Feet with 4½" Drill Pipe. Servicing and Rotary Workover to 10,000 Feet.

Brakes: 42" dia. x 8" face.
Powered by diesel or gas engine up to 300 horsepower.

These modern rigs are similar in design. **Both** have—

Torque Converter drives,

Oil Bath multiple strand roller chain drive to countershaft,

Torqmatic three-speed and reverse transmission that can be shifted under full load and at full speed, instantly, without slowing, declutching or in any way losing time in shifting gears.

Air Friction Clutches in drums. Single drum or double drum models. These units mounted as trailer rigs with heavy, two pole, telescoping masts are exceptionally fast to move and set up on the job. Tubing boards and rod hangers automatically go into place when mast is telescoped.

Cooper D-50 trailer rig with 91 ft. extra heavy two pole telescoping mast, tubing board and rod hangers on a 10,000 foot well.

Cooper builds rugged machinery for the toughest jobs.

FRED E. Cooper, Inc.

P. O. BOX 1890 TULSA, OKLA.
Houston, Odessa, Los Angeles

Petroleum Industry Supply To Distribute for H. C. Smith

Formation of Petroleum Industry Supply Co., Inc., to be exclusive distributor of H. C. Smith rock bits and hole openers throughout Peru, Bolivia, Chile, Brazil and Ecuador, has been announced by the new supply company's president and general manager, Ray Poole.

Ray Poole

Associated with Poole is Ing. Manuel Carrera V., who will be vice president and northern division manager. The supply company's headquarters will be located in Lima, Peru, and branches will be maintained in Piura, and Paita, Peru.

•

Nilsson Named Manager Of Witte Engine Works

Kjell O. Nilsson has been named general manager of the Witte Engine Works of United States Steel's Oil Well Supply Division.

A native of New York, Nilsson entered the employ of "Oilwell" in 1952 as assistant to the works manager. Prior to his employment by U. S. Steel, he was associated with American Bosch Corporation in the factory and sales division.

Nilsson will be assisted by D. M. Hochswender, manufacturing manager; Dr. F. J. Kogel, chief engineer; M. E. Nicklin, sales manager, and L. A. Tilman, auditor.

General American Transportation Buys Tank Storage Terminal

General American Transportation Corporation has purchased and will operate the tank storage terminal of Phillips Petroleum Company at Pasadena, Texas, Port of Houston.

The Pasadena terminal becomes the fourth terminal in Texas and the seventh in the United States operated by General American.

The Pasadena terminal now has a capacity of 510,000 barrels of tankage. General American is building an additional 1,170,000 barrels of tankage—all equipped with Wiggins Floating Roofs.

W. A. Buckner, superintendent of General American's terminal at Galena Park, Houston, will supervise the Pasadena, Texas terminal operation.

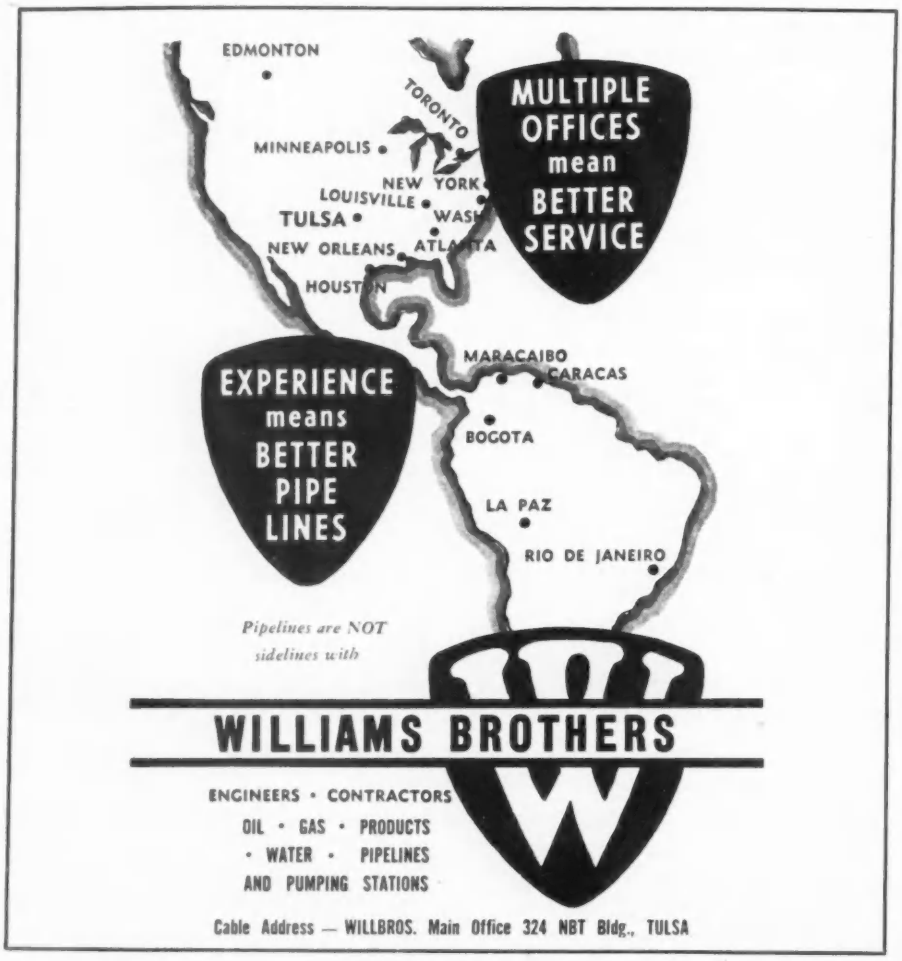
•

International Harvester Advances Buzard to Manager—Truck Sales

Ralph M. Buzard has been appointed manager of International Harvester's Motor Truck Sales department.

Buzard succeeds W. K. Perkins, who will become staff assistant to the vice president, working on special assignments.

A native of Ashland, Ohio, Buzard began his Harvester career in 1922 as a salesman at the company's Akron, Ohio, district sales office. After serving in various sales and managerial positions, he was transferred to the company's general office in 1946 as an assistant manager of motor truck sales.



A. F. Canada, Jr.

G. F. Graham

Walter J. Bahler

J. W. McCormick

Pacific Pumps Announces Executive Advancements

A. F. Canada, Jr., formerly mid-continent regional manager for the centrifugal pump division of Pacific Pumps, Inc., has been appointed sales manager of that division. He has been associated with Pacific Pumps since 1945.

G. F. Graham, formerly assistant sales manager of the plunger pump division, has been appointed sales manager of that division. A veteran of more than thirty years in oil well pumping equipment, he joined Pacific Pumps in 1933.

Walter J. Bahler, known in the Tulsa area for his experience in the sales engineering of machinery, has been appointed manager of Pacific's Tulsa office, centrifugal pump division.

J. W. McCormick, a Pacific sales engineer in California and New York for the past twelve years, has been advanced to assistant manager of the firm's centrifugal pump office in New York.

•

Darling Manufacturers Advance Evans and Cowan

M. Stuart Evans has been appointed eastern regional sales manager by Darling Valve and Manufacturing Company at Williamsport, Penn. He joined Darling as district representative in Tulsa in 1950.

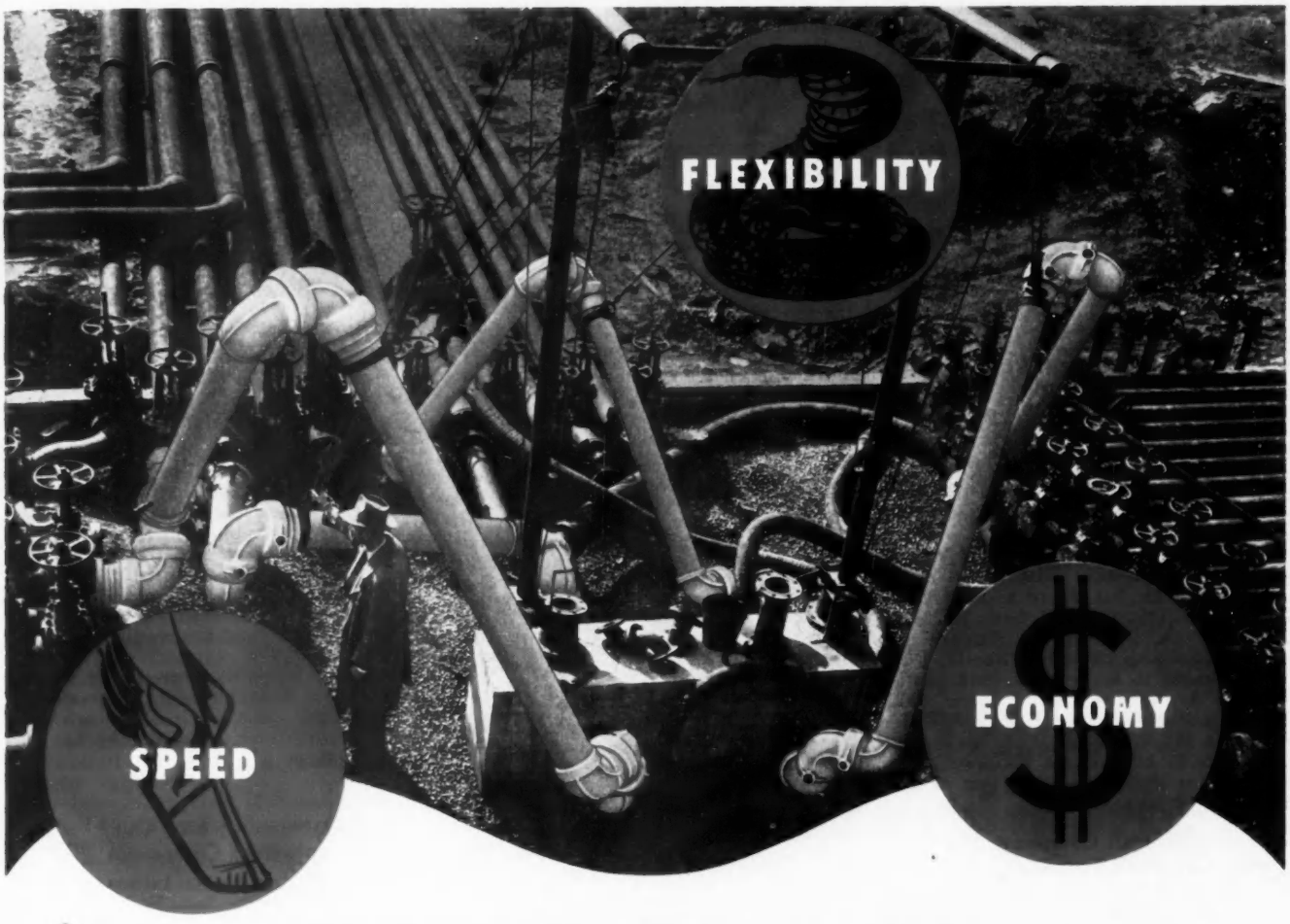
Joseph T. Cowan has been named district representative in the Tulsa territory. His previous experience has brought him in contact with the oil, gas and public utility industries in the Southwest.

•

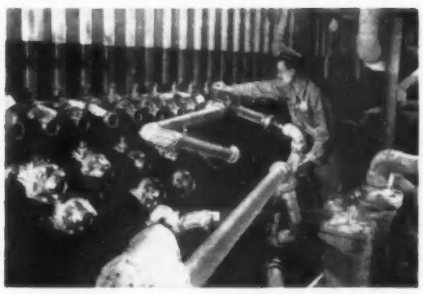
Quinn and McGill to Distribute Electric Brakes for Warner

Quinn and McGill Motor Supply Company, Denver, has been appointed a distributor for the Warner Electric Brake & Clutch Company, Beloit, Wis.

The Denver firm will act as sales and service organization for Warner electric brakes for commercial trailers in Colorado, New Mexico, Wyoming, and portions of Montana, Nebraska and South Dakota.



CHIKSAN Swivel Joints illustrated in this installation, facilitate the speedy, economical handling of various fluids through 16 lines from loading dock to manifolding pit — a distance of 800 feet. Since each line leads to a separate tank through the manifold, cross contamination is eliminated.



CHIKSAN Swivel Joints in the pump manifold above enable operator to pull base stock from outside storage into the plant and direct flow to proper vessel or proportioner.

The Flow of Enterprise Relies on

CHIKSAN

Ball-Bearing Swivel Joints

CHIKSAN Manifolding Saves 3 Ways!

- √ ORIGINAL INSTALLATION
- √ NO CONTAMINATION LOSSES
- √ LOW COST OPERATION

Original cost of CHIKSAN flexible line manifolding installations often run as much as 50% less than fixed line manifolding operations which incorporate costly multiple valve and line systems.

A CHIKSAN manifolding operation is simplified in its entirety — providing complete flexibility, mobility and ease of operation in limited spaces.

CHIKSAN manifolding installations reduce line hook-up time — keep pit floor clear of lines thereby providing greater working areas.

CHIKSAN manifolding operations facilitate the transfer of all types of fluids safely and rapidly under extreme climatic conditions with no possibility of cross contamination.

CHIKSAN manifolding installations are specifically engineered for long life — easy and economical maintenance, and render years of trouble-free operation.

Our Engineering Research and Development Department will welcome inquiries on your manifolding problems.

Write for Catalog 53-C, Dept. 2-WO

CHIKSAN

Representatives in Principal Cities

CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 28, Illinois • Newark 2, New Jersey

Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Chiksan Export Company (Subsidiary), Brea, California • Newark 2, N. J.

Clarence Strait

W. C. (Dub) Gray

Gray, Strait Switch Posts At Security Engineering

W. C. (Dub) Gray, who for the past ten months has been Security Engineering Division's Gulf Coast manager, has been transferred to the post of Oklahoma division manager, while Clarence Strait, former Oklahoma division manager, moves to the Gulf Coast division manager post.

Gray, who recently returned from a year's leave of absence, first joined Security in 1945. He has served as sales manager for the Oklahoma division, the Gulf Coast division, and Security Engineering Ltd. at Edmonton, Alberta, Canada.

Strait came to Security in 1948, working first as district sales manager, and later as assistant division manager in the Houston office. In 1952 he moved to Oklahoma to become the divisional sales manager for that territory, a post he has held until the recent switch.

McCullough Tool Company Names Campbell Engineer

K. K. (Kibby) Campbell has been appointed sales engineer at the Houma, La. branch of the McCullough Tool Company.

Campbell is a graduate of Louisiana State University, class of 1942 and during World War II, served as an infantry officer. For the past several years, he has been a sales engineer for Reed Roller Bit Company in South Louisiana.

Stewart & Stevenson Salesmen Rank Among Top Eighteen

Fourteen salesmen from Stewart & Stevenson Services, Inc. were listed among the top 18 in the final W. T. Crowe Diamond Award standings for leadership in GM Diesel sales during 1953.

Ray Loden placed first in the standings for the Detroit Diesel Engine Division's Central Southwestern sales zone which includes Texas and Oklahoma. Loden also placed first in standings released earlier in the year.

Other Stewart & Stevenson salesmen in the top 18 are N. N. Elkins, Emmett Dobbs, M. McInnis, L. L. Howell, Grady Foster, R. O. Brehm, C. Pratas, W. E. Rutledge, A. B. Grant, Joe Rucker, E. E. Childress, R. E. Spriggs, and J. Ellis.

Blair Elected President Of Canadian Bechtel Ltd.

Sidney M. Blair of Toronto has been elected president of Canadian Bechtel Limited. Blair has been vice president and a director of Canadian Bechtel and has been associated with Bechtel in Toronto since 1949.

From 1927 until 1949 he was associated with Trinidad Leaseholds, completing his service with this oil company as controller of research and development.

Chester Sappington

T. O. Hall

General Geophysical Elects Sappington Chairman of Board

The Board of Directors of General Geophysical Company has elected new officers to succeed Earle W. Johnson, founder of the company, who died recently.

Chester P. Sappington, formerly a vice president of General and a member of the firm since 1940, was elected chairman of the board. T. O. Hall succeeds Johnson as president. He was formerly a vice president of the company and has been with General since 1938.

Kenneth R. Wells, a member of the firm since 1936, was elected vice president of the company and A. B. Grubb was re-elected secretary-treasurer, a position he has held since 1946.

Texas Instruments Buys Out Two Geophysical Companies

Texas Instruments Incorporated and Geophysical Service Inc., Dallas, in a joint announcement disclosed the acquisition by Texas Instruments of the remaining 25 percent ownership of Geomarine Service Inc. and Geomarine Service International S. A. Seventy-five percent interest had been acquired in April, 1953.

J. E. Jonsson, TI president, stated that, with the current increase in offshore petroleum exploration, the purchase companies are a valuable part of TI-GSI services to their customers.

Cecil H. Green, as president of Geophysical Service Inc., heads the petroleum exploration activities of the Texas Instruments family of companies. Green said that no major change is contemplated in the operations of the two geomarine companies.

Weatherhead Appoints Kelsey Manager-Export Sales

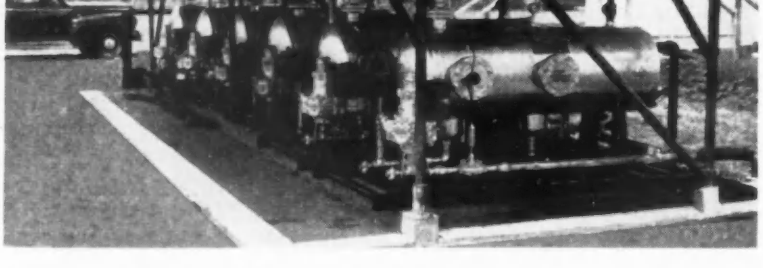
Charles P. Kelsey has been named manager of export sales at The Weatherhead Company. He will direct selling activity for all divisions of the company in markets outside of the United States and Canada.

Charles P. Kelsey

Kelsey is a former Weatherhead employe, having been assistant production manager and export manager. Recently he served as assistant to the president of the Lee Wilson Engineering Company. Before originally joining Weatherhead in 1947, he held the position of vice president in charge of exports for Continental Corporation.

ROLO WELLCHECKERS

SIX LEASES PRODUCING INTO ONE TANK BATTERY



This battery of six skid-mounted 4-IH-2406 Rolo Wellcheckers makes it possible to produce six one-well leases into a single tank battery. Installations of this type, of which Rolo Mfg. Co. has made many, are approved by regulatory bodies. Let us work with you on your problem.

Rolo Wellcheckers are made in all sizes to fit any operation. See Composite Catalog or write for illustrated bulletin.

Crude Oil Metering Specialists

ROLO MANUFACTURING COMPANY

P. O. BOX 6763, HOUSTON 5, TEXAS

BRANCHES: Corpus Christi, Midland, Kilgore, Tulsa, New Orleans, Los Angeles, Bakersfield, Casper, Mt. Vernon (Ill.), Calgary, (Alta.) Petroleum Industry Consultants, Apartado 3992, Caracas, Venezuela

EXPORT OFFICE: R. S. Stokvis & Sons, Inc., 17 Battery Place, New York, N. Y.

R. P. Montgomery

C. J. Kentler

Rockwell Manufacturing Company Announces Employe Promotions

Rockwell Manufacturing Company has announced promotions of three employes.

J. Pommersheim

Dr. Charles J. Kentler, Jr., manager of refinery and chemical sales, has been named technical consultant for the meter and valve division.

Dr. Kentler joined Rockwell in 1950 after three years as assistant plant manager of the chemical division of Wallace and Tiernan, Inc. Before that, he had spent seven years as chemical and development engineer for Congoleum-Nairn, Inc., Tidewater Associated Oil Company and Tennessee-Eastman Corporation.

A chemical engineering graduate of Yale University, he received his Ph.D. degree in chemical engineering from Cornell University.

Joseph Pommersheim of Pitcairn, Penn., a project engineer at Rockwell's Homewood plant, has been promoted to chief engineer of the company's Norwalk, Ohio, plant.

A native of Pittsburgh and 1941 mechanical engineering graduate of the University of Pittsburgh, Pommersheim joined Rockwell in November, 1952.

Previously he had spent two years as a design engineer for Miller Pottery Engineering Company and four years in the drafting department of United Engineering and Foundry Company.

Ronald P. Montgomery, buyer-general purchasing, has been appointed purchasing agent for Rockwell Meters, Inc.

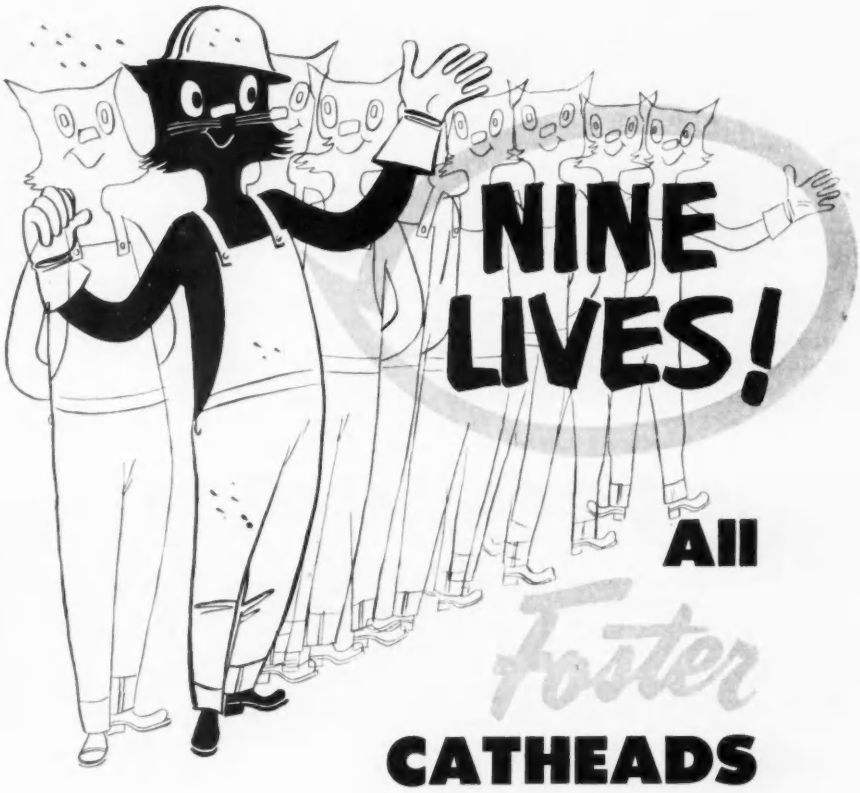
A native and lifetime resident of Pittsburgh, Montgomery joined Rockwell a year and a half ago after three years as buyer for Fisher Scientific Company.

H. O. Proske, service manager-meter and valve division, has been named national representative specializing in gas meter sales promotion. Proske will supervise sales and production liaison between the firm's gas meter manufacturing plants and the Rockwell field sales force and sales management.

Proske joined Rockwell in 1937 as a sales engineer in the Kansas City area and was promoted to service manager in 1952. Before joining Rockwell, he studied engineering at Washington University in St. Louis, Mo., and joined the City of St. Louis Water Department as pitometer engineer in 1928.

Homelite Names Marschalk Chicago Sales Manager

R. J. Marschalk has been appointed Chicago district sales manager for the Homelite Corporation. In his new position, with headquarters at Melrose Park,



NINE LIVES!

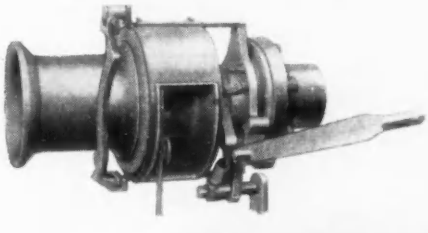
All Foster CATHEADS have that and more!

Foster Catheads are famous throughout the industry for their long service. Many of them have been in operation on well after well for years without repairs of any kind. Heavy duty anti-friction bearings, ample lubrication, low pressure per square inch of clutch face, make this long life, repair-free service possible.

With Foster Spinning Catheads there's no need to hand wrap the spinning line; the line will not foul and wind up; and it can be stopped instantly by releasing the control.

For complete details of these two Foster Catheads see pages 1760 and 1762 of the Composite Catalog.

MIDGET SPINNING CATHEAD



SPINNING CATHEAD

PLUS FEATURES

Instant engagement without reducing lineshaft speed ● will spin and tong with forked line ● cannot engage accidentally.

★ OUR 25 YEARS OF EXPERIENCE ASSURE YOU YEARS OF SERVICE.

Foster CATHEAD COMPANY
P. O. BOX 1675 WICHITA FALLS, TEXAS
FACTORY REPRESENTATIVES

R. N. Bean, Los Angeles, Calif. Green Head Service, Oklahoma City, Okla.
Moore Specialty Co., Casper, Wyoming. Texas Warehouse Service, Corpus Christi, Texas
Tillery & Parks, Odessa, Texas. R. D. Cloninger, Lafayette, La.
Peck Sales & Service, Houston, Texas. Rotary Sales & Service, Ltd., Edmonton, Alberta, Canada
Woodco Sales & Service, Great Bend, Kansas. W. O. Nelson, Farmington, N. M.

Ill. Marschalk will be responsible for the operation of Homelite's Chicago district sales office and for the supervision of Homelite field representatives in Milwaukee, Bloomfield, Ill., and Melrose Park. Marschalk transferred from Homelite's San Francisco office where he was district manager.

At the same time, R. S. Kennedy was named manager of Homelite's Melrose Park branch office where he will take charge of all local sales in the Chicago area. Kennedy was formerly Homelite's branch manager at Fresno, Calif.

Three Appointments Announced At Raybestos-Manhattan

Three appointments at the Passaic, N. J. plant of Raybestos-Manhattan, Inc., Manhattan Rubber Division are announced.

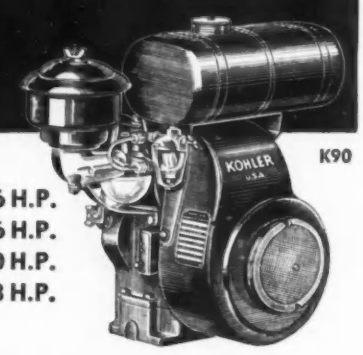
C. P. McHugh, who has been manager of the roll and tank departments, is now assistant director of research and product design, working with W. L. White, director, in Manhattan's Laboratories. McHugh has been with Manhattan for 23 years, is a graduate chemical engineer from Massachusetts Institute of Technology and was previously connected with the Laboratories.

S. F. Horesta, assistant manager of the roll and tank departments, succeeds McHugh as manager. He has been with Manhattan Rubber for 28 years and received his B. S. and M. E. degrees from Cooper Union.

E. D. Hines, sales engineer in the tank department, will be assistant manager. Hines is a graduate of William & Mary and started with Manhattan in 1934.

KOHLER ENGINES

4-CYCLE
AIR-COOLED



K90

K160

K90 3.6 H.P.
K160 6.6 H.P.
K330 12.0 H.P.
K660 26.8 H.P.

Kohler Engines are engineered and manufactured to the high standards which have made the Kohler mark known for quality the world over.

Power for garden tractors, pumps, sprayers, snow removal equipment, grain elevators, hoists, portable saws, concrete mixers, compressors, industrial lift trucks.

Write for information

K330

K660

Kohler Co., Kohler, Wisconsin
Established 1873

KOHLER OF KOHLER

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

Peters Returns to Totco After Mid-Continent Tour

H. H. (Pete) Peters, president of Technical Oil Tool Corporation recently returned from a two-months' field trip through the mid-continent area. During this time, Peters and E. G. McConnell, vice-president and mid-continent manager for Totco, conducted a series of meetings with Totco service representatives. Discussing ways and means of improving customer service, the Totco executives held "shirt sleeve" sessions in Oklahoma City, Houston and Odessa.

H. H. Peters

Mendow Succeeds Nelson As Lockett Chief Engineer

F. Robert Mendow has been named chief engineer of A. M. Lockett & Company succeeding Bernard S. Nelson, who has retired as vice president—engineering.

Mendow joined Lockett following his graduation from Tulane University in 1930.

Nelson became chief engineer in 1919 and in 1951 became vice president. He received his degree from Tulane University.

K. J. Downs Appointed Design Engineer at Chiksan

Kenneth J. Downs has been appointed chief design engineer of Chiksan Company. He will supervise the design and development section of the Engineering department and will direct the operation of the Test Laboratory.

Downs has been with Chiksan Company four years as a design engineer and has worked on the tooling and design of swivel joints and on special design projects.

Butler Manufacturers Name Edlund Manager

Harold A. Edlund has been promoted to the post of general sales manager of the Butler Manufacturing Company. He joined Butler in May, 1952, and has been assistant general sales manager.

Harold A. Edlund

A graduate of the University of Pennsylvania's Wharton School, Edlund has served in various sales manager positions. Prior to World War II, he was with Cannon Mills, Inc. Immediately after the war he became associated with the General Aniline and Film Company as Western sales manager and later took over the direction of national sales for the Arco Company.

C. K. McDonald

R. A. Heckel

National Supply Company Advances Four in Midwest

Four personnel changes in the Midwest division of The National Supply Company have been announced following the recent promotion of Kenneth O. Hoevel, division sales manager, to division manager-Northwest division.

N. E. Allen

Carey K. McDonald, district manager, has been named division sales manager; Norman E. Allen, division merchandising supervisor, was promoted to district manager; R. A. Heckel, sales engineer for rotary equipment, became assistant division sales manager; and Lee A. Douthat, assistant office manager, was named division merchandising supervisor.

McDonald started with the company in 1928 as a clerk in the Tulsa store. He had subsequent experience at Ada, Okla., and Stafford, Kansas. He was appointed assistant district manager at Tulsa in 1942 and district manager in 1943.

Allen started in the Tulsa store in 1927 and held various positions in the sales, credit, purchasing, and engineering departments. He was named assistant district manager in 1943 and division merchandising supervisor in 1949.

Heckel started in 1926 in the store at Garber, Okla., and had other experience at Wichita, McPherson, Russell and Hayes, Kansas, and in Oklahoma City. He was named sales engineer for rotary equipment at Tulsa in 1947.

Douthat started in the Independence, Kansas, store and served later in Winfield, McPherson, and Chase, Kansas, rising to assistant office manager at Tulsa. He served the export division in Venezuela during part of 1953.

Alten Foundry and Machine Works Names Belcher Representative

W. A. (Lon) Belcher of Oklahoma City has been named sales representative of Alten Foundry and Machine Works. He will direct sales of Alten and Ideco-type pumping units in Oklahoma.

W. A. Belcher

Belcher was formerly affiliated with Petroleum Specialty Company and Greenhead Supply Company.

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New Books, Maps and Movies

THE TEXACO STORY—THE FIRST FIFTY YEARS, Marquis James, The Texas Company.

Three years after the Spindletop gusher of January 10, 1902, production of the miracle field near Beaumont, Texas, dropped from 62,000 barrels to 5,000 barrels a day, within one year. With the drop, most of the 200 oil companies engendered by the strike faded from view as quickly as the historic well itself dropped in production. Of the original 200 companies, only two have survived to become factors in the oil industry today.

In "The Texaco Story—The First Fifty Years," Marquis James, Pulitzer prize-winning biographer, chronicles the early struggles and later successes of one of the survivors, The Texas Company. The book, sponsored by The Texas Company, has just come off the press.

Texaco survived when dropping production devastated other companies because of the farsightedness of Joseph S. Cullinan. "Buckskin Joe," as he was called in his young days, arrived in the midst of the Spindletop boom a few days after the first well blew in. A successful oil man and honor graduate of the most astute oil business school in the world at that time—the Rockefeller, or Standard school—he saw the opportunities that lay in getting the Spindletop oil to refineries. He enlisted aid and financial assistance of eminent personalities in business circles to found Texas Fuel Company.

Arnold Schlaet, a New York investor who came to respect Cullinan as a practical oil man, was one of the prominent men to join the venture, but he disagreed with one detail in Cullinan's plan. As Texas Fuel Company was not chartered to produce oil, Cullinan wanted to organize an affiliated producing company. Schlaet considered the idea premature, contended there was too much production already. (At one time at Spindletop water sold for 10 cents a cup while oil went for only 3 cents a barrel.)

Without Schlaet's help or sanction (Schlaet had returned East), Cullinan had his way about a producing company. With another group of wealthy men he organized Producers Oil Company as an affiliate of Texas Fuel Company, which on April 7, 1902, became The Texas Company.

When Spindletop began playing out, Texaco faltered, but only for a short time. Through the newly-formed Producers Oil Company it took big and profitable parts in strikes at Sour Lake, Saratoga and Batson, Texas, and Jennings, La.

From this beginning, James' story of Texaco's growth evolves into a strong argument for competitive private enterprise. With Cullinan in Texas, organizing, planning and continuously expanding it, and Schlaet in New York, pushing sales and securing much of the capital needed for Cullinan's seemingly reckless schemes, the company grew. It declared its first dividend the first year, and began construction of an asphalt plant and a refinery. In the next ten years four refineries were built to go with the original one; its Port Arthur-to-Humble pipe line was extended to Tulsa, and its sales organization was pushed over most of the U. S. and into foreign countries. These and other developments enabled Texaco to move forward against the competition of other independents and against Standard.

Cullinan left the company he had played such a large part in founding in 1913 and, in so doing, provided an appropriate marker at the end of Texaco's formative years.

From that year to this, except for the depression years, The Texas Company history has been marked by steady technical and scientific advances and by spectacular expansion. World War I, the increased use of automobiles, foreign trade, development of the Holmes-Manley thermal cracking process, advertising, World War II and many other events gave impetus to Texaco's growth. Today it is the fourth largest oil company in the U. S.

•

THE MIDWEST OIL REGISTER, C. L. Cooper, P. O. Box 7066, Tulsa 18.

Twelve pocket-size, plastic-bound personnel directories covering the entire oil industry are off the press. More than 50,000 key men are listed in these directories. The first seven books cover produc-

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ing and drilling contracting in Texas, Oklahoma, California, Kansas, Michigan-Illinois-Indiana-Kentucky, Louisiana-Arkansas-Mississippi-Georgia-Florida, the Rocky Mountain region and New Mexico. The remaining five directories cover personnel in refining, natural gasoline and cycling plants, pipe line industry, Latin America, Canada, geophysical and oil companies who use geophysical service, and oil well supply companies. The directories will be sent on approval.

•

FUNDAMENTALS OF RESERVOIR ENGINEERING, John C. Calhoun, Jr., The University of Oklahoma Press, Norman, Okla., 1953. $6.

The author analyzes fundamental developments in establishing specific principles of engineering pertaining to problems of petroleum production as they are applied by reservoir engineering and petroleum scientists striving to improve techniques in oil and gas recovery. This material is presented as a series of discussions with illustrations, diagrammatic sketches, examples and problems. The author covers the following fields: behavior of reserve fluids, study and treatment of rock properties, fundamentals of fluid flow in porous media, summary of reservoir energies and forces, and estimation of oil in place and oil production. The series first appeared in *The Oil and Gas Journal* and is now arranged in book form.

•

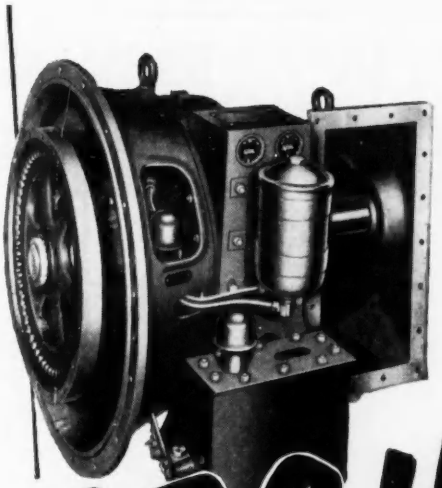
PRICE MAKING AND PRICE BEHAVIOR IN THE PETROLEUM INDUSTRY, Petroleum Monograph Series, Volume 1, Ralph Cassady, Jr., Yale University Press, New Haven, 1954. $4.00.

In this detailed study of the dynamics of competition, made with the full cooperation of the oil industry, the author exposes the actual techniques of business rivalry. He analyzes the nature of competition, the economic principles underlying competitive behavior, and the complex factors determining pricing at crude, refinery, tank wagon and retail levels. He shows how individual companies operate in the attempt to wrest business away from one another, how opponents are chosen, how a price war is waged, and what legal problems enter into a system of competitive arrangements.

•

PIPE AND TUBE BENDING, Paul B. Schubert, The Industrial Press, 148 Lafayette Street, New York 18, N. Y. $5.

This practical working manual describes and illustrates all of the common methods of bending ferrous and non-ferrous pipe and tubing, the machines, fixtures, and devices used, and gives data and pointers useful in the shop and the field. The book is written for shop and field men, designers and engineers who are concerned with the bending of pipe and tubing for all types of indoor and outdoor applications such as tubular fabrication, food and chemical process piping, and both private and commercial radiant heating installations. Information is arranged so the reader can compare the various methods and become familiar with their advantages and limitations.



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S-T-R-E-T-C-H Rig Performance CUT Down-time

Throughout the oil fields, operators report cheaper, faster hole from their Twin Disc Torque Converter-equipped rigs.

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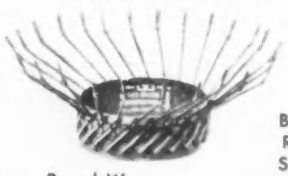

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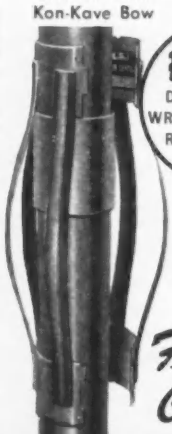

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SQUEAKS from the BULLWHEEL

"Him? Oh, that's the driller. He lost a bit in the hole yesterday so the toolpusher decided he'd let him carry it around a couple of days so he'd remember from now on.

Not to Strangers!

To the extreme annoyance of the other passengers, a boy of seven riding on a train was constantly sniffling.

Finally, a spinster sitting across the aisle entered the picture.

"Little man," she said reproachfully, "do you have a handkerchief?"

"Yes, ma'am," he said with great dignity, "but I never lend it to strangers."

Classified

After the engagement was broken, the young lady returned all the man's letters marked: "Fourth Class Male."

•

Good Drinker

Two Scotch friends had been drinking merrily for some time when suddenly one lost his grip on the bar and fell face down on the floor. "Aye, laddie," said his companion to the bartender, "that's one good thing about Jock. He always knows when to stop."

•

Rank Conscious

Two privates paused at the side of the road to puzzle over a dead animal they saw there. "It has two stripes," said one. "That settles it," said the other. "It's either a skunk or a corporal."

•

Giving His Awl

The shoemaker was explaining to a complaining customer the reason for the poor quality of his soles. "All the good leather," he said, "is going into steaks."

•

Para-dox

A plunging neckline is something you can approve of and look down on at the same time.

•

Tools of the Trade

A psychiatrist saw another psychiatrist racing down the street with a couch on his head.

"Why the couch?" he called after his colleague.

The hurrying one replied breathlessly: "House call!"

Gotkool water cans and coolers

GOTKOOL WATER CAN
Made in 1½, 2, 3, 5, 10, 15 and 20 gallon sizes. Push-Button Faucet at slight additional cost.

KEEP PURE DRINKING WATER ALWAYS HANDY

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Made in 2, 3, 5, 8, 10, 15 and 20 gallon sizes with Push-Button Faucet.

GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug-fitting, large, removable top, handy non-leaking push-button faucet. GOTT Water Cans for handy field use. Your supply store has them, get one today!

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NEW SERVICES • NEW TOOLS
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Accurate, Consistent, Stable and Reliable Logs On Every Run In The Well

SHARPSHOOTING THIN ZONES MADE PRACTICAL BY "PIN POINT" ACCURACY OF McCULLOUGH RADIATION WELL LOGGER

Exact measurement and definition of any potentially productive interval, thick or thin, assures "putting the shots where they count" for greater production — more oil!

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RADIATION WELL LOGGER with SCINTILLOMETER (GAMMA RAY AND NEUTRON LOGS)

HERE'S A GOOD EXAMPLE:

The well completed was in an old field where the zones are very thin and many of the sands produce 100% water. An error of a very few feet in measurements means the difference between success or failure. Ran the McCullough Radiation Well Logger with Scintillometer and simultaneously recorded a collar log. Collar locations checked within 6" at 3600'.

Shot four ½" burrless holes in five feet of shale for W. S. O. On bailing test, there was no fluid rise in 19 hours. Proceeded with production perforating of 200 plus holes with a 4¼" McCullough M-3 Burrless Bullet Perforator in the zones indicated by the log between 3633' and 3770'. There was a 400' fluid rise by the time the last M-3 Gun was fired. The well was completed as a good commercial producer.

HERE ARE REASONS WHY:

1. Efficiency in measuring gamma radiations approaches 100%
2. Very short length counter.
3. More detail in log.
4. Faster logging speeds possible.
5. Calibrated in absolute International Units established by United States Bureau of Standards.
6. Extremely stable equipment.
7. Log accurately repeats itself—running in and out of hole.
8. All controls at the surface.
9. Log detail can be varied.
10. No base line drift; no sensitivity drift.
11. Records all or selected band of entire range of gamma radiations.
12. Simultaneous recording of collar log.
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Most economical cook we've ever had—raises all his own vegetables, even the rice!

Not Hard to Choose

"I've often wondered how a sheik chooses just one lovely girl from his harem."

"That's easy—he has his servant stand up and throw water on each girl as she passes. When he finds one that sizzles—well, that's it!"

•

Not So Bad

There are many complaints about the weather, but probably not half as many as there would be if the government regulated it instead of predicting it.

Dictionary for Businessmen

Consultant: Any ordinary guy more than 50 miles from home.

Under Active Consideration: We're looking in the files for it.

Will Advise You in Due Course: If we figure it out, we'll let you know.

The Issue Is Closed: I'm tired of the whole affair.

Coordinator: The guy who has a desk between two expeditors.

Channels: The trail left by inter-office memos.

•

Easy Way to Fish

A Saturday morning golfer observed two small boys watching him and remarked: "You boys will never learn by watching me."

"We ain't interested in golf, Mister," said the small boys. "We're going fishing as soon as you dig up some more worms."

•

Modern Age

A third-grade lad was being told about microwaves—their speed and other amazing properties—at the telephone company's open house in Waco. Suddenly he asked:

"How long are they?"

"About as long as a cigarette," the telephone narrator replied.

The boy hesitated a moment, then queried further:

"Regular or king size?"

•

So Obvious

Insurance Adjuster: "When you found all of the bureau drawers open and the contents scattered, why did you not report the robbery at once?"

Housewife: "I just supposed that my husband had been hunting a clean shirt."

"It's oil, sir....LANE-WELLS on the job."

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Hard or medium, deep or shallow, you'll recover more core at less cost (fewer trips) with Core Lab's Contract Diamond Coring. No bits to buy. No diamonds to inventory. No barrels and parts problems.

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You Need this Hopper on your Rig

A BEMCO Mud and Cement Hopper lets your crews mix dry materials *when they need them*, without waiting for trucks or other mixing equipment.

The hopper is made of heavy steel sheet with a reinforcing bead around the top; table is designed for fast dumping and is equipped with a revolving cutter; jet chamber provides perfect mixing of all materials.

Order your BEMCO Hopper today . . . and it will probably start paying dividends tomorrow.

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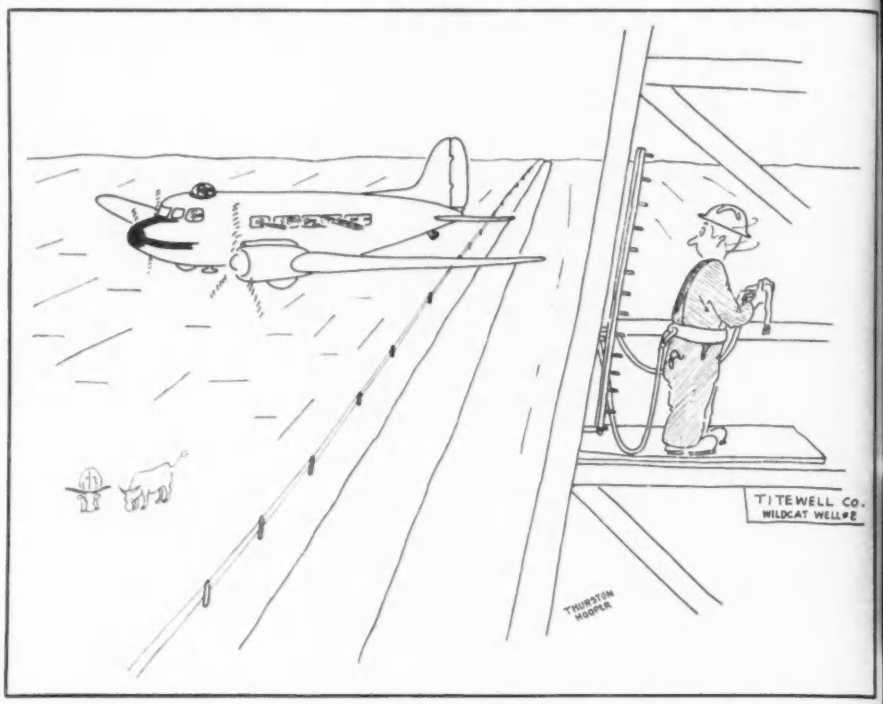

Hazards

An old fellow was crossing a busy intersection when a large St. Bernard ran past him and bowled him over. The next instant a small sports car skidded around a corner inflicting more serious bruises.

A bystander helped him to his feet and someone asked if the dog had hurt him much.

"Well, not exactly," was the reply, "but that can tied to his tail did me some damage."

•

Bare Limbs, Maybe

"Pick up everything that's not growing," ordered the sergeant to the policing detail.

Just then a pretty bobby-soxer passed. The sarge blew his whistle and shouted. "Halt men, that's still growing."

INCREASE PRODUCTION

CLEAN OUT CHOKING SAND

Excessive sand and sediment holds back your oil. For fast, easy clean out with fewer round trips and less down-time, use world famous Miller Sand Pumps.

PUMP & BAILER SIZES
O.D.—2½, 3, 3½, 4¼, 5, 5½, 7 inches.
Lengths—20, 25, 30 ft.

Composite Catalog Page 3433

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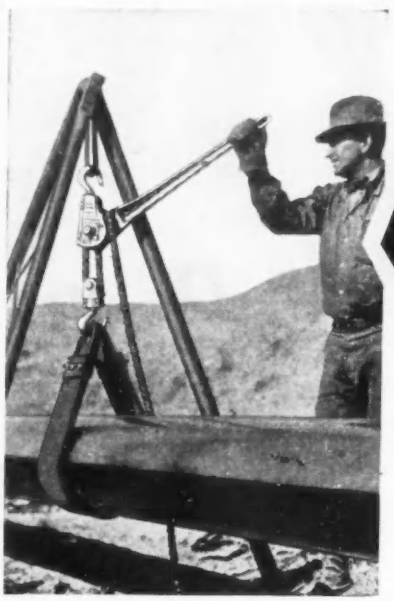

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One man with a Safety-Pull Ratchet Lever Hoist does the lifting, pulling, holding work of many — in shop or field. Even the smallest Safety-Pull, weighing only 14 lb., delivers a 1500-lb. vertical or horizontal pull — is ready to go to work wherever hooked. Lifting pipe, pulling rod lines, stretching guys—these are but a few of the jobs it handles easily, safely.

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